efforts to minimize such disclosure and obtain an assurance that the recipient shall accord confidential treatment to such Confidential Information, and shall notify the other party contemporaneously of such disclosure.

18. Notices and Correspondence. All notices and correspondence shall be sent by either party in writing to the other in matters dealing with this Agreement to the following addresses:

If to UUNET:
3060 Williams Drive
Fairfax, VA 22031
Attention: General Counsel
Fax: 703-206-5807

If to USWC:

1801 California Street
Suite 5100
Denver, CO 80202
Attention: Karen Tatelman
Fax: 303-308-9456

or any other address provided prior written notice is given to the other party. Notices may be sent by registered or certified mail, postage prepaid, receipt requested, by nationally recognized overnight courier or by fax. Notices shall be deemed delivered within five days of mailing, the day after deposit with the overnight courier, or upon electronic confirmation of fax transmission.

19. Notice of Labor Disputes. Whenever USWC has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of any Service, USWC shall immediately give notice thereof to UUNET.

20. No Use of Trademarks. Neither party may use the name, logo or any other trademarks or service marks of the other party in any advertising, signage, marketing materials, brochures or any other materials in any medium without the other party's express advance written permission. Any such permitted use shall be only within guidelines provided by the other party.

The parties hereby execute and authorize this Agreement as of the latest date shown below:

UUNET Technologies, Inc.	U S WEST Communications, Inc.
Authorized Signature	Authorized Signature
DAVID R. BOAST	Solomon Trujillo
Name Typed or Printed	Name Typed or Printed
VP; DIAL ACCESS NETWORK	President & CEO
Title	Title
12/30/98	12/15/98
Date	Date

ATTACHMENT 1
SERVICE DESCRIPTION and SYSTEM DESIGN
SS7 Gateway/COBRA
(Page 1 of 3))

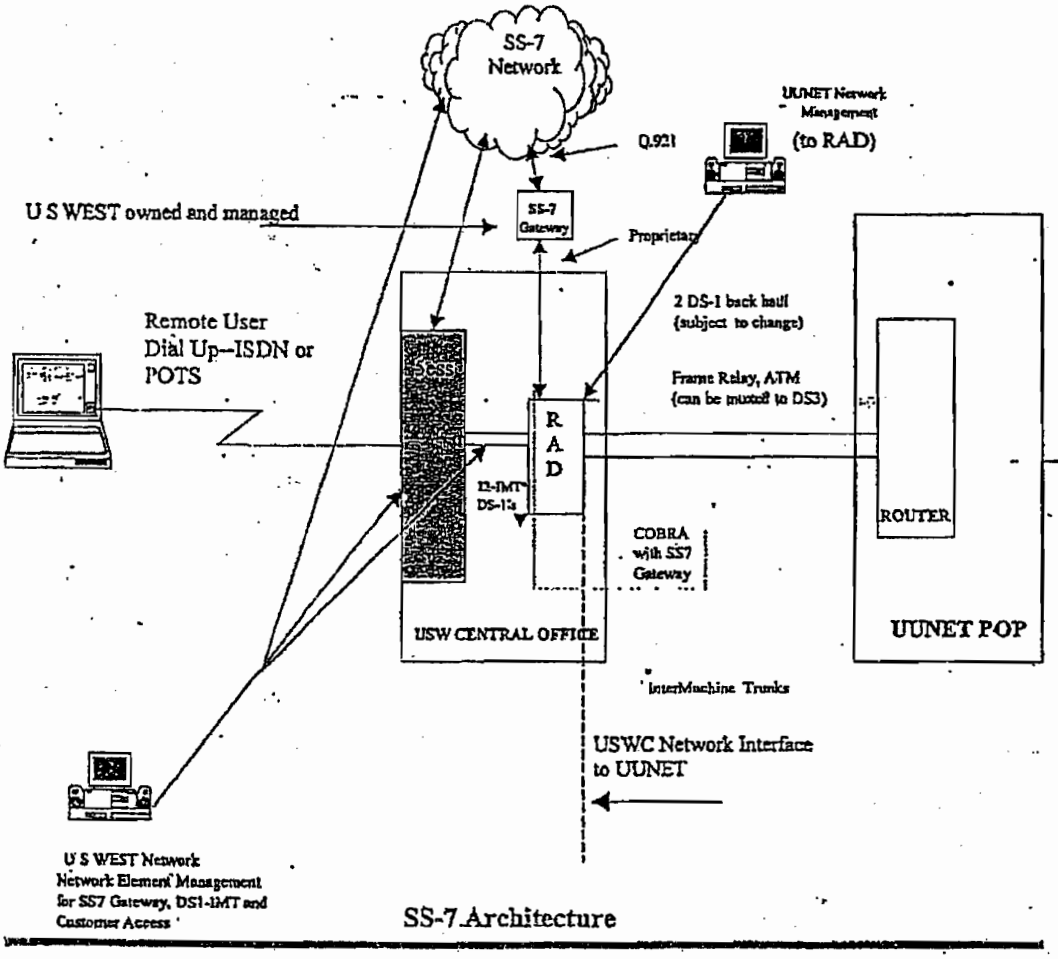
Central Office SS7 Gateway Based Remote Access, is an architecture placing a USWC owned Remote Access Device ("RAD") in local Central Offices. ISP end user customers will dial local access numbers via digital or analog lines to gain access to the RAD via route signaling from the SS7 Gateway. In an effort to balance network traffic, RADs will be reasonably distributed among Digital Switching Systems designated by USWC and connected to the SS7 signaling network. Office selection will be performed with consideration of UUNET demand presence in each office. Calls from non-SS7 Gateway Central Offices will be routed over Interoffice Facilities to the nearest Central Office equipped with a SS7 Gateway connections and RAD for call completion. Modem pools in the RAD will complete the calls and perform an agreed upon network concentration delivered by USWC to UUNET. UUNET requests USWC to offer a finished, bundled, custom contracted service priced by the modem port rather than circuit. USWC billing to UUNET would be based on the total number of active ports and pending firm orders, where the price per port is determined by an agreed upon tiered structure. The SS7 Gateway and RAD architecture applies to new service, service on order, and migration of all existing active Primary Rate ISDN and Dial Access service. UUNET is requesting the SS7 Gateway and RAD based service as a new contract superseding previous term contracts, beginning a new seven-year term.

No locally stored content will be delivered to or originated by from the Remove Access Device. This includes physical and logical links to locally stored software, browsers, video, directory listings or other information based services.

In order to reach the customer objectives of an SS7 based service, the customer and U S WEST agree to deploy a Central Office Based Remote Access (COBRA) based RAD architecture as an interim step. The RAD deployed will be selected and installed by U S WEST for customer service. The RAD is capable of being upgraded to support SS7 Gateway service with minimum service interruption. Migration schedules and strategies will be mutually agreed upon in the regular Executive meetings.

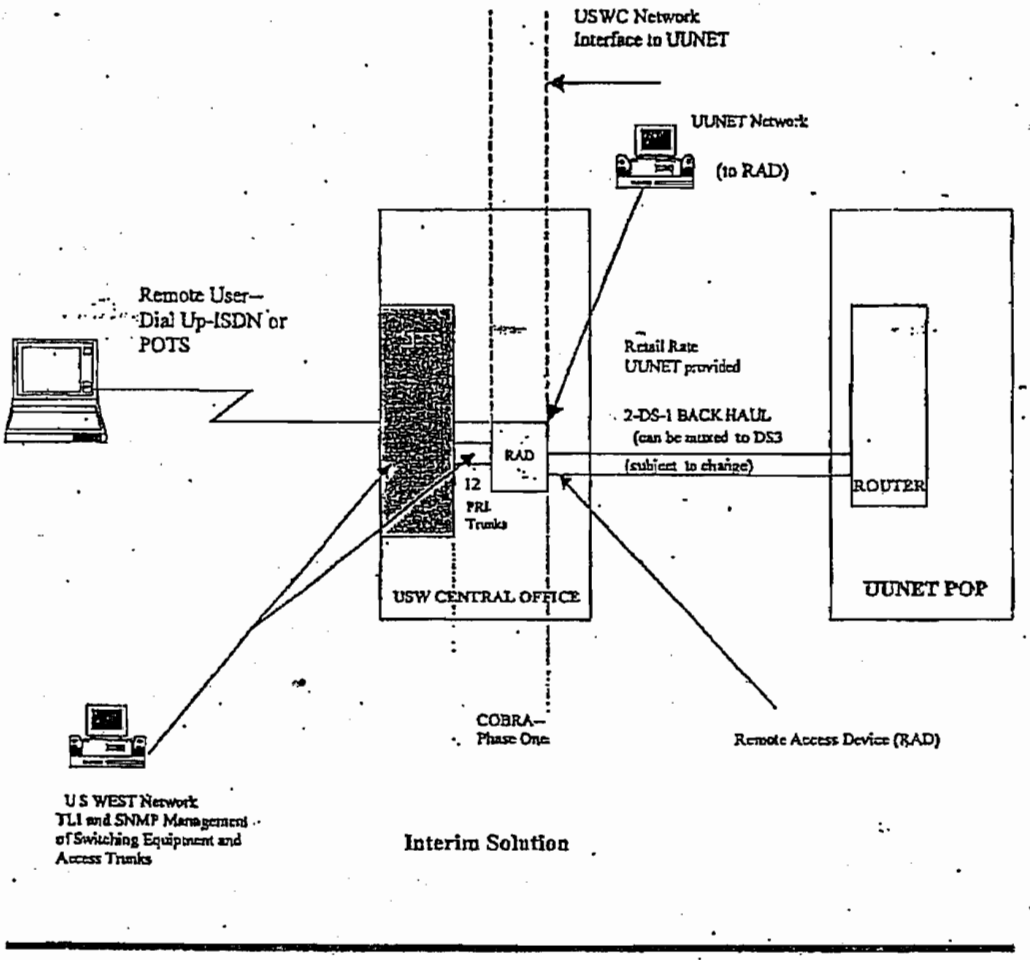
SS7 Gateway functionality is an additional capability which will be added by the vendor to the COBRA RAD and is supported exclusively by USWC.

Attachment 1 (Page 2 of 3) – SS7 Gateway



SS-7 Architecture

Attachment 1 (Page 3 of 3) –Interim Platform



Interim Solution

ATTACHMENT 2
USWC SITES WITH EXISTING UUNET CIRCUITS

STATE	CITY
ARIZONA	
	Flagstaff *
	Phoenix
	Tucson
COLORADO	
	Aspen *
	Colorado Springs
	Denver
	Fort Collins
IDAHO	
	Boise
	Hailey *
IOWA	
	Cedar Rapids
	Davenport
	Des Moines
	Iowa City
MINNESOTA	
	Minneapolis
	St. Cloud
MONTANA	
	Butte *
	Great Falls *
	Helena
NEBRASKA	
	Omaha
NEW MEXICO	
	Albuquerque
	Santa Fe
NORTH DAKOTA	
	Fargo
OREGON	
	Eugene
	Portland
	Salem
SOUTH DAKOTA	
	Sioux Falls
UTAH	
	Ogden *
	Provo
	Salt Lake City
WASHINGTON	
	Auburn
	Bellingham *
	Olympia
	Silverdale/Bremerton
	Seattle
	Spokane
	Tacoma
WYOMING	
	Cheyenne
	Laramie *

TOTAL # OF CITIES: 38

* = Denotes less than 12 installed or pending PRI in that city.

ATTACHMENT 3 – Hardware Configuration
(Page 1 of 2)

TNT Specific Configuration (Remote Access Device)

Each TNT unit is called a shelf, which has 16 slots. The standard configuration consists of two 8-port T1 cards, an HDLC controller, and six modem cards, each having 48 56K KFLEX modems. The T1 cards have eight ports, numbered 0-7, and terminate either PRIs/Channelized T1s from the LEC switch (ingress circuits), or hi-cap frame T1s going to the UUNET backbone (egress circuits). Our standard is to use ports 0-5 on each card for ingress and to use port 6 for egress. For each TNT shelf, we maintain an ingress to egress circuit ratio of 6:1 or less. A fully loaded shelf supports a total of 12 ingress circuits and 2 egress circuits. Port 7 of both T1 cards is not required, but it may be used for reserve capacity.

The 6:1 or less egress ratio has a distinct advantage. Assume that a COBRA installation has 18 ingress and 3 egress circuits. Any additional ingress T1s activated would require an additional egress circuit in order to maintain the 6:1 or less ratio. However, suppose that 2 additional ingress T's were activated, bringing the total to 20, and a fourth egress was activated to support it. There would then be room to activate an additional 4 ingress T1s upon receiving an order without requiring any activation other than the ingress T1s from the switch to the TNT, all of which is entirely within the LECs control.

TNT Configuration

The figure on the next page shows the back of a fully loaded DC-powered TNT. The card type and slot number is shown on the left. Note that the controller card at the top of the chassis is in slot 17. Subsequent cards start with slot number 1. Slot 4 is empty. The modems occupy two slots each. Each modem card has enough modems to service 2 PRIs.

The equipment must be new and in the original packaging. USWC must have newly produced, never registered, non-refurbished equipment from the vendor.

ATTACHMENT 3
(Page 2 of 2)

Fully Loaded TNT Configuration

(QTY)	Ascend Part Number[1]	Description
(1)	TNT-DC	Chassis with 1 DC power
(1)	TNT-SP-DC	Second DC power
(1)	TNT-SL-HA192	HDLC Slot Card
(2)	TNT-SL-CT1	T1 Slot Card
(1)	TNT-SO-ISDN	ISDN software
(1)	TNT-SO-FR	Frame Relay Software
(1)	TNT-SP-DRAM-32	32MB DRAM
(6)	TNT-SL-48MOD-S56	48 Port slot card (Series 56 & V.34)

Minimum TNT Configuration

The minimum COBRA implementation that UUNET would deploy in any given site is 6 PRIs.

(QTY)	Ascend Part Number	Description
(1)	TNT-DC	Chassis with 1 DC power
(1)	TNT-SP-DC	Second DC power
(1)	TNT-SL-HA192	HDLC Slot Card
(1)	TNT-SL-CT1	T1 Slot Card
(1)	TNT-SO-ISDN	ISDN software
(1)	TNT-SO-FR	Frame Relay Software
(1)	TNT-SP-DRAM-32	32MB DRAM
(3)	TNT-SL-48MOD-S56	48 Port slot card (Series 56 & V.34)

[1] To the extent the current part number is used to represent different hardware or functionality from that which is represented at the time of this Agreement, USWC may terminate this Agreement under the provisions contained in the Agreement.

ATTACHMENT 4

PRICING

1. The term of this Agreement is seven (7) years from date of execution.
2. A minimum of 40,000 ports (DS0 equivalents) for the interim platform, SS7 Gateway and/or HCDT DS0 equivalents must be ordered by UUNET on or before December 31, 1998.
3. Pricing tiers are determined by ~~In~~ Installed and Working ~~circuits~~ ports and pending ports as defined in Section 9.
4. USWC may flow through any price increase or decrease of equipment from UUNET's certified vendor equipment provided to UUNET on a percentage basis from the current costs.
5. Non-recurring charges ("NRC") - $125.00 per DS0 port. NRC are waived for all ports if UUNET reaches a port level of 40,000 or more in and working or pending DS0 ports.

VOLUMES	INTERIM PLATFORM RATES PER MONTH	SS7 RATES PER MONTH
40,000	$58	$51
40,001 – 50,000	$57	$50
50,001 – 60,000	$56	$48
60,001 – 70,000	$53	$44
70,001 – 85,000	$49	$40
85,001 – 100,000	$45	$36
100,000 +	$41	$33

ATTACHMENT 5
SERVICE LEVEL AGREEMENT

1. Problem Resolution Process for the Dial Access Equipment

USWC ("Contractor") will provide hardware support and maintenance, and deployment of Resources necessary to fix/replace hardware failures (once UUNET has contacted the Contractor and requested assistance). Should an alarm occur, UUNET will be responsible for contacting the Contractor's Network Operations Center (NOC). UUNET is responsible for determining the source/cause of the problem (Problem Identification) and resolving the problem (Problem Resolution). UUNET may or may not choose to take action on an alarm. If the alarm involves a hardware failure, UUNET will contact the Contractor's NOC, provide specific information on the location and type of activity to occur (example: replace module XXX in device YYY located at ZZZ location). The Contractor's NOC will then deploy the appropriate contracted resources to address the hardware problem.

2. Service Response

The service interval for Contractor's response is to be determined by the criteria outlined below. A grade 1 problem is the most critical, grade 3 the least.

GRADE	OUTAGE / PROBLEM
1	Circuit/ hardware outage inclusive of and between telephone switch, local cabling and wiring, and RAD. (The connections referred to are hardwired connections from the IMT port on the Central Office Switching System running to the RAD.) (Major alarms as reported to USWC NOC by UUNET or to UUNET NOC by USWC NOC.)
1	No response from maintenance ports on any associated equipment located in the Central Offices.
2	Circuit/ hardware outage inclusive of and between telephone switch, local cabling and wiring, and RAD. (The connections referred to are hardwired connections from the IMT port on the Central Office Switching System running to the RAD.) (Minor alarms as reported to the USWC NOC by UUNET or to UUNET NOC by USWC NOC.)

level, a
service ... ages

5. Unc

All com

3	Any non service affecting problems on any associated equipment located in the Central Offices.
3	Requests for call back on non service affecting issues.

GRADE	CONTRACTOR RESPONSE TIME FRAMES
1	Mean time to respond 30 minutes Mean time to repair 2 hours for Tier 1 (High Density) cities Mean time to repair 4 hours for Tier 2 (Low Density) cities
2	Mean time to respond 2 hours Mean time to repair 4 hours (Hardware is on-site) Mean time to repair 24 hours (Hardware must be ordered)
3	Mean time to respond 4 hours Mean time to repair by end of next business day

Response time is defined as the timeframe for a USWC National Account Center technician to provide acknowledgment of receipt of a trouble report from a UUNET Network Operations Center technician.

3. Circuit Activation

Provisioning, test, and acceptance of the egress circuits are UUNET/ USWC's responsibility. Provisioning, test, and acceptance of the ingress PRI/DSS will be the joint responsibility of UUNET, configuring the RAD, and USWC, configuring the switch side.

USWC intends to aggressively schedule and cutover COBRA locations to accommodate UUNET's requirements.

4. Remedies

Each Calendar quarter the parties will conduct an Operations Review at which USWC will present analysis on its performance against the metrics set forth in this SLA. If for two consecutive calendar months USWC has failed to meet the Mean Time to Respond or Mean Time to Repair for all Grade 1 and Grade 2 problems (based on the average of the top ninety percent of all Grade 1 and Grade 2 trouble tickets opened that month), both Parties mutually agree to the following action plan: 1) Within 7 days of review, both Parties will meet to determine deficiencies and develop mutually acceptable remedies and timeline to improve service levels, 2) Escalation to USWC executive

EXHIBIT A

RESPONSIBILITY MATRIX

Version→	INTERIM PLATFORM		SS7/COBRA	
Item/Device	**TNT (RAD)**		**TNT (RAD)**	SS7 Gateway
• Ownership	USWC		USWC	USWC
• Hardware configuration	USWC		USWC	USWC
• Software configuration	UUNET		UUNET	USWC
• Hardware Alarms and Diagnostics	UUNET		UUNET	USWC
• Hardware Repair	USWC		USWC	USWC
• NMS Functions	UUNET		UUNET	USWC
• Install Hardware	USWC		USWC	USWC
• Software Alarms and Diagnostics	UUNET		UUNET	USWC
• Install Software	UUNET		UUNET	USWC
• Software Repair	UUNET		UUNET	USWC
• Physical Access to Hardware	USWC		USWC	USWC
• Software Certification Testing	Joint		Joint	USWC
• NMS Access	UUNET		UUNET	USWC
• End-user demand and locations (LSOs)	UUNET		UUNET	NA
• Network Topology • RAD Locations • COBRA Locs	USWC		USWC	USWC
• Network Capacity Planning	Joint		Joint	USWC

ORIGINAL

COPY

SBC & UUNET MSA
SERVICE SCHEDULE A

DIAL ACCESS SOLUTION – INTERNET SERVICE PROVIDER

This Service Schedule is entered into by the parties pursuant to the Master Services Agreement between SBC Global Services, Inc. ("SBC") and UUNET Technologies, Inc. ("UUNET" or "Customer"), dated December 31, 1999 ("Agreement"). The Agreement and this Service Schedule, along with any applicable tariffs identified herein, set forth the terms and conditions applicable to the provision of Dial Access Solution – Internet Service Provider services ("DAS Services") by SBC and its affiliates. Words and phrases defined in the Agreement shall have the same meaning in this Service Schedule. This Service Schedule shall be effective as of December 31, 1999 ("Service Effective Date").

A.1. Service Description; Demarcation.

(a). The DAS Services provide integrated, remote dial access service to Customer, its end users, and the end users of Customer's clients and resellers via modems referred to as network access servers ("NAS") deployed in central offices operated by SBC or an SBC affiliate classified as an incumbent local exchange carrier ("SBC COs"). The DAS Services provide medium to high-speed data transport services for remote dial access to Customer's network. The DAS Services permit Customer to receive calls from multiple analog modems and ISDN basic rate interface lines for handoff to separately purchased wide area network links. SBC shall connect each NAS used in connection with the DAS Services provided hereunder to the Public Switched Telephone Network ("PSTN") via ISDN primary rate interface ("PRI") or comparable telecommunications facilities, and shall arrange for the dedicated assignment of unique telephone numbers for use by Customer, its end users (for example, America OnLine), and the end users of Customer's clients (for example, a subscriber to America OnLine). SBC shall bill Customer for the use of the DAS Services in accordance with the provisions of the Agreement and this Service Schedule.

(b). The DAS Services include all equipment, telecommunications services and related facilities (including without limitation active PRI lines, at least 40 DID numbers per rotary, space, power, and other utilities), and ancillary support and maintenance required to connect a call which has been dialed into the PSTN (such call dialing a designated telephone number) to an active DS0 channel-equivalent port (i.e., PRI B-channel) on the corresponding NAS ("DAS Port"). The demarcation of the DAS Services between SBC and Customer shall be at the connection of the NAS egress port to the egress circuit connecting the NAS to the SBC or SBC affiliate's wide area network and/or Customer's network.

A.2. Applicable Service Territory. The prices set forth in this Service Schedule shall apply to all DAS Services purchased hereunder for deployment in those SBC COs where DAS Services are available from SBC and/or its current and future affiliates. SBC agrees to use commercially reasonable efforts to make the DAS Services available in all SBC COs.

A.3. Service Ordering Procedure.

(a). Customer shall provide SBC with a request for information ("RFI") in writing identifying (i) the number of DAS Ports being considered for deployment by Customer; and (ii) the geographic location (for a new rotary) or the central office (for the expansion of an existing rotary) for such identified DAS Ports.

(b). SBC shall have seven (7) calendar days from receipt of such RFI to advise Customer in writing whether (i) SBC agrees to provision such identified DAS Ports within the SLA installation time frame set forth in Section A.10(c) below; (ii) SBC agrees to provision such identified DAS Ports within an alternative, reasonable time frame that is greater than the SLA installation time frame set forth in Section A.10(c) below; or (iii) SBC does not agree to provision such identified DAS Ports.

(c). In the event that SBC responds affirmatively to Customer's RFI (in other words, provides a response pursuant to Sections A.3(b)(i) or A.3(b)(ii) above), Customer shall have seven (7) calendar days from receipt of SBC's written response to send SBC a firm and binding order in writing ("Firm Order") for the identified DAS Ports. Once SBC receives Customer's Firm Order, any cancellation by Customer of such Firm Order shall be subject to any applicable early termination charges as set forth in Section A.14 below, unless otherwise provided by the Agreement or this Service Schedule. If Customer does not send SBC a

Firm Order within seven (7) calendar days from receipt of SBC's written response, Customer's RFI and SBC's response thereto shall be deemed to have expired.

(d). In the event that SBC responds negatively to Customer's RFI (such negative response not being caused by an event of Force Majeure or SBC's inability to secure NAS equipment meeting Customer's specifications), SBC agrees that the number of identified DAS Ports thereafter shall count towards: (i) Customer's satisfaction of any applicable minimum purchase commitment set forth in Section A.8 below; and (ii) the number of active and ordered DAS Ports pursuant to Section A.4(a) below. In the event that SBC responds affirmatively in part and negatively in part regarding the DAS Ports identified in Customer's RFI, this Section A.3(d) shall apply only with respect to those DAS Ports for which SBC does not agree to provision.

A.4. Service Prices.

(a). The monthly fee per DAS Port for a given calendar month shall be based on the number of active DAS Ports, plus the number of DAS Ports identified in any Firm Orders issued by Customer, plus the number of DAS Ports subject to the provisions set forth in Section A.3(d) above, plus the number of DAS Ports subject to the provisions set forth in Section A.10(e) below, plus the number of DAS Ports subject to the provisions set forth in Section A.14(e) below, and plus the number of DAS Ports subject to the provisions set forth in Section A.15 below, all of which to be determined as of the last day of such month, in accordance with the following table and subject to the Minimum Purchase Commitment set forth in Section A.8 below:

Active & Ordered DAS Ports	Monthly Fee per DAS Port
0 – 400,000	$25.50
400,001 – 500,000	$24.50
500,001 +	$24.00

(b). No non-recurring charges shall apply with respect to the DAS Services provided that the Minimum Purchase Commitment set forth in Section A.8 below is met. To the extent that any applicable tariff includes non-recurring charges, SBC agrees that such non-recurring charges already have been factored into the monthly fee for the DAS Services as set forth above; provided that all other performance obligations of Customer described in this Service Schedule, including the Minimum Purchase Commitment set forth in Section A.8 below, are met.

A.5. Service Acceptance Procedures. Customer's acceptance of new or migrated DAS Ports at a given location shall be made promptly following the successful completion of service acceptance tests conducted jointly by the parties. At a minimum, such service acceptance tests shall include the login and RADIUS authentication to Customer's network via the newly deployed DAS Ports.

A.6. Service Billing Procedures. SBC shall bill Customer monthly in arrears based on the applicable monthly fee specified in Section A.4(a) above for all active DAS Ports as of the last day of the preceding month.

A.7. Egress Circuit Access. The prices set forth herein for the DAS Services include any applicable NAS egress port fees, but exclude any egress circuit charges. SBC agrees, to the extent consistent with its then current policies applicable to similar interconnections, to fully cooperate with Customer and any third-party provider selected by Customer to connect any SBC NAS or SBC wide area network equipment to Customer's network via an egress circuit provisioned by such third-party provider to an SBC central office or SBC wide area network location. SBC shall be compensated by Customer for any work associated with such interconnection to the extent SBC is compensated by third parties for similar work.

A.8. Minimum Purchase Commitment. Customer agrees to maintain a minimum of 300,000 active DAS Ports each month beginning with the first day of the thirteenth (13th) month after the Service Effective Date ("Minimum Commitment Date"). In the event that Customer does not have 300,000 active DAS Ports during a given month after the Minimum Commitment Date, Customer agrees to pay SBC for 300,000 DAS Ports in each such month

regardless of the actual number of active DAS Ports. This minimum purchase commitment shall expire as of the end of month 60 after the Service Effective Date.

A.9. NAS Equipment.

(a). Ownership. SBC or its affiliates shall own all of the NAS equipment used in connection with the DAS Services.

(b). Selection. In providing the DAS Services, SBC agrees only to use NAS equipment that is approved by Customer in advance in writing. For any given Firm Order, the parties shall cooperate to determine the applicable NAS equipment to be deployed in connection with those new DAS Ports.

(c). Support & Maintenance. SBC or its affiliates shall provide Customer with 24x7x365 NOC-to-NOC technical support. SBC shall proactively maintain all NAS equipment (along with all related equipment) used in connection with the DAS Services. SBC will examine its processes and consider revisions in servicing Customer's accounts in an ongoing effort to provide improved customer service for Customer.

(d). Operational Control. Notwithstanding Section A.9(c) above, Customer shall be exclusively responsible for the operational control (i.e., logical access) of all NAS equipment used in connection with the DAS Services. Customer shall be exclusively responsible for the purchase, installation, and management of all software upgrades for the NAS equipment. SBC shall assist Customer in the resolution of any NAS equipment failure in accordance with agreed-upon maintenance procedures. SBC shall have no responsibility for the authentication of end users accessing the DAS Services. Customer shall be exclusively responsible for controlling all end user access to the DAS Services. Customer agrees that SBC shall not be responsible under the Agreement or this Service Schedule for any failure by Customer to properly operate the NAS equipment. If Customer causes the failure of any NAS equipment, Customer shall pay SBC the reasonable costs for repairing such NAS equipment in accordance with agreed-upon maintenance procedures and any resulting fee schedules.

(e). Technology Upgrades. In the event that the manufacturer of NAS equipment used in connection with the DAS Services offers a hardware upgrade to such NAS equipment, the parties shall confer and mutually agree as to whether to deploy such hardware upgrade in connection with the DAS Services. In the event that such hardware upgrade involves any out-of-pocket costs, the parties also shall agree upon the appropriate cost sharing arrangement.

A.10. Service Level Agreements ("SLA").

(a). Service Availability. Service outage credits may be claimed by Customer when any DAS Port is interrupted or does not meet performance standards for any period lasting one (1) or more consecutive hours. No credit will be available if the interruption is caused by (i) the failure of Customer to properly operate the NAS equipment as set forth in Section A.9(d) above; (ii) the negligence or willful misconduct of Customer; or (iii) an event of Force Majeure as provided in the Agreement. The amount of the credit shall be equal to the pro-rata monthly fee due for all affected DAS Ports during which a confirmed outage has occurred, including the initial one (1) hour. Outages may be confirmed only by an SBC employee authorized to make such determinations and will be calculated in ½-hour increments, or major fraction thereof, of the interruption.

(b). Service Failure Response Times. SBC shall use commercially reasonable efforts to diligently respond and repair any service failure based upon the grade of the failure, in accordance with the tables set forth below.

GRADE	OUTAGE / PROBLEM
1	PRI outage between the telephone switch and the NAS equipment
1	No response from maintenance ports on any NAS or associated equipment located in a central office
1	More than 30% of the modems at any one central office are not responding
1	Any "single point of failure" piece of hardware outputting major alarms
2	Less than 30% of the modems at any one central office are not responding
2	Any "single point of failure" piece of hardware outputting minor alarms
3	Any non-service affecting problem on any associated equipment located in a central office.
3	Requests for documentation
3	Requests for call back on non-service affecting issues

GRADE	TIME FRAME TO RESPOND / REPAIR
1	Mean time to respond: 30 minutes
1	Mean time to repair: 4 hours
2	Mean time to respond: 2 hours
2	Mean time to repair: 12 hours (hardware is onsite)
2	Mean time to repair: 24 hours (hardware must be ordered)
3	Mean time to respond: 4 hours
3	Mean time to repair: By end of next business day

(c). Installation Objective. SBC agrees to use commercially reasonable efforts to install all new DAS Ports within forty-five (45) calendar days after receipt of a Firm Order from Customer. SBC immediately shall provide written notice to Customer in the event that SBC determines after beginning the DAS Port installation process that it will not be able to meet this installation objective, and upon receipt of such notice Customer may cancel the ordered DAS Ports without liability for any termination charges.

(d). PRI Service Objective. SBC agrees to use commercially reasonable efforts to deploy the DAS Services via PRI facilities.

(e). Operations Reviews & Chronic Failures. Each calendar quarter the parties shall conduct an operations review at which time SBC shall present analyses of its performance against the foregoing SLA provisions. If SBC does not meet the combined Grade 1 and Grade 2 response and repair times for more than ten-percent (10%) of all Grade 1 and Grade 2 failures in a given month ("Chronic Failure") after there are at least 50,000 active DAS Ports during the first 12 months after the Service Effective Date, and at any time

thereafter provided Customer is satisfying the Minimum Purchase Commitment set forth in Section A.8 above, both parties agree to: (i) within seven (7) calendar days after the operations review, meet to determine the nature and source of such performance deficiencies and to develop mutually agreeable remedies and timelines to improve performance; (ii) escalate the identified deficiencies to SBC senior management for enhanced performance oversight; and (iii) negotiate in good faith a mutually-agreeable monetary settlement with respect to the identified performance failures. In the event that SBC has Chronic Failures affecting more than 15,000 active DAS Ports during two successive calendar quarters after the beginning of the thirteenth (13th) month following the Service Effective Date (and Customer is satisfying the Minimum Purchase Commitment set forth in Section A.8 above), Customer may terminate the affected DAS Ports without liability for any termination charges. Any DAS Ports cancelled by Customer due to Chronic Failures shall continue to count towards: (i) Customer's satisfaction of any applicable minimum purchase commitment set forth in Section A.8 above; and (ii) the number of active and ordered DAS Ports pursuant to Section A.4(a) above.

(f). Escalation Matrix. SBC agrees to provide Customer with an operations and senior management escalation matrix, and to update and maintain such matrix on a current basis for the service term of this Service Schedule. Such matrix shall include email addresses and telephone access numbers for operations and senior management points of contact who are available and authorized to address and resolve Service performance issues on a 24x7x365 basis.

A.11. Migration of Existing Capacity.

(a). The parties acknowledge that the migration of existing PRI services provided by SBC affiliates to Customer ("PRI Services") may require the installation of certain equipment and facilities. Consistent with the availability of such equipment and facilities, the migration of the PRI Services to the DAS Services hereunder shall be established pursuant to an installation schedule to be agreed upon by the parties in writing during the thirty (30) days following the Service Effective Date. Successful migration of any portion of such PRI Services shall be deemed to have occurred when the replacement DAS Services are provided to and accepted by Customer pursuant to Section A.5 above. SBC agrees that all existing telephone numbers shall be preserved in the migration to the DAS Services unless otherwise agreed-upon by Customer in advance in writing.

(b). The rates included in this Service Schedule are not valid for PRI Services until the circuits are converted to the DAS Services. Once a circuit is converted, it falls under the terms and conditions of the Agreement and this Service Schedule. All migrated DAS Ports shall be deemed to have been installed during calendar year 2000. In the event such conversion would impose upon Customer any termination penalties associated with SBC affiliate services, SBC and Customer agree that they will cooperate with each other, and any other SBC affiliate, to arrange the offering of services hereunder in a mutually agreeable manner that fully avoids the impact of such termination penalties.

(c). To the extent that SBC adds new DAS Services ordered hereunder to any given central office, SBC also shall migrate all PRI Services connecting to such central office at the same time.

(d). SBC shall commence the migration of all PRI Services to the DAS Services upon the Service Effective Date. All migrated DAS Ports shall be deemed to have been ordered by Customer as of the Service Effective Date. Subject to Section A.11(b) above, the parties' objective shall be to migrate all PRI Services to the DAS Services within six (6) months of the Service Effective Date. In the event that any PRI Services are not successfully migrated to the DAS Services by such deadline, SBC agrees to bill for all PRI Services that remain to be migrated at the rates set forth herein and to use its best efforts to complete the migration as expeditiously as possible.

(e). If the migration of PRI Services is delayed due to changes initiated by Customer or the acts or omissions of Customer, or due to any Force Majeure event, SBC shall have the right to extend the migration deadline for the affected PRI Services by the period of such delay. All such delays shall be communicated as soon as practical between Customer's project coordinator and SBC's project manager.

A.12. Service Portability. Beginning as of January 1, 2001, Customer may during the course of each calendar year terminate up to 10% of the total number of active DAS Ports as of January 1st of such calendar year without

liability for any early termination charges; provided that (i) the number of new DAS Ports ordered by Customer during such calendar year is equal to or greater than the number of DAS Ports terminated during such calendar year; and (ii) the terminated DAS Ports have been in service for at least 8 months. During the first 12 months after the Service Effective Date, Customer may terminate up to 30,000 DAS Ports; provided that the foregoing portability conditions shall apply. Customer shall be liable for any applicable early termination penalties in accordance with Section A.14 below for any excess DAS Ports terminated by Customer, or if Customer fails to satisfy the foregoing portability conditions with respect to any terminated DAS Port.

A.13. Applicable Federal, State, or Local Tariffs.

(a). The parties acknowledge that various tariffs may apply with respect to the DAS Services that are provided by SBC in certain states and/or other identified locations. Within 30 days of the Service Effective Date, SBC shall provide Customer with a list of all such applicable tariffs and the corresponding territories.

(b). In the event that SBC is required to make any tariff filings with respect to this Service Schedule, SBC agrees to provide Customer with a draft of such tariff filing for Customer's review, comment, and approval, which shall not be unreasonably withheld, conditioned, or delayed by Customer. SBC agrees to afford Customer a reasonable period of time to conduct such review, but no less than ten (10) calendar days, and to incorporate or otherwise address any reasonable comments provided in writing by Customer to SBC. In no event shall such a tariff filing be inconsistent with or contrary to the terms and conditions of the Agreement or this Service Schedule. Notwithstanding anything in this Service Schedule or the Agreement to the contrary, in no event may Customer receive credit for DAS Ports cancelled due to the time the DAS Services could not be provided while Customer was reviewing a proposed tariff filing. In addition, in the event that regulatory decisions, as interpreted by SBC in its reasonable discretion, make the assignment of this Service Schedule to an SBC affiliate advisable to SBC, then SBC shall have the right to make such assignment; provided that the terms and conditions of this Service Schedule shall not be modified as a result of such assignment.

A.14. Service Term & Early Termination Liabilities.

(a). The service term of this Service Schedule shall expire as of the expiration or termination of the last active DAS Port provided hereunder.

(b). Each DAS Port shall be in service until the initial expiration date applicable to such DAS Port based on the year in which such DAS Port was installed by SBC and accepted by Customer, in accordance with the table below.

Year Installed	Initial Expiration Date
2000	12/31/04
2001	12/31/05
2002	12/31/06
2003	12/31/07
2004	12/31/08

(c). Upon the applicable initial expiration date for a given DAS Port, such DAS Port automatically shall be renewed on a month-to-month basis, unless either party provides the other party with thirty (30) days prior written notice of its intent not to renew such DAS Port.

(d). Except as otherwise provided in the Agreement or this Service Schedule (including without limitation Section A.12 above), if Customer cancels a given DAS Port prior to its applicable initial expiration date, Customer shall pay an early termination charge equal to the number of months remaining until the applicable initial expiration date for such DAS Port, times the then-current monthly fee per DAS Port, times the applicable termination percentage based upon the number of months that such DAS Port was in service in accordance with the following table:

Months in Service	Termination Percentage
0 – 12	100%
13 – 36	90%
37 – 60	80%

(e). Any DAS Port that Customer cancels and for which pays a termination charge as set forth in Section A.14(d) above shall continue to count towards: (i) Customer's satisfaction of any applicable minimum purchase commitment set forth in Section A.8 above; and (ii) the number of active and ordered DAS Ports pursuant to Section A.4(a) above.

A.15. Sale of Assets. In the event that SBC or its affiliate sells any network assets used in connection with the DAS Services to a third party, the number of DAS Ports associated with the network assets sold by SBC or its affiliate shall continue to count towards: (i) Customer's satisfaction of any applicable minimum purchase commitment set forth in Section A.8 above; and (ii) the number of active and ordered DAS Ports pursuant to Section A.4(a) above.

A.16. Annual Review. Beginning in January 2001, the parties shall meet on an annual basis each January to review and discuss the DAS Services' architecture and equipment, market conditions, and the market competitiveness of the prices and commitment levels set forth herein, as well as any business, performance, or operational issues as may arise between the parties. The parties also shall discuss the deployment of future technologies in SBC's networks, including without limitation alternative call delivery technologies (e.g., SS7 and/or soft switch technologies), and any corresponding price decreases associated with such deployment. The parties agree to negotiate in good faith to maintain the competitive viability of this Service Schedule.

A.17. COBRA Architecture White Papers. The following two (2) white papers set forth certain technical parameters and operational requirements applicable to the DAS Services provided hereunder.

(a). Lucent/Ascend Equipment. See Exhibit A-1 to this Service Schedule.

(b). 3com Equipment. See Exhibit A-2 to this Service Schedule.

AUTHORIZED APPROVALS

UUNET TECHNOLOGIES, INC.

By: _____

Printed Name: _____

Title: _____

SBC GLOBAL SERVICES, INC.

By: _____

Printed Name: R. Wilkins

Title: Pres: SBC-BCS

Approved By: UUNET LEGAL Department

By: _____

Signature

Date 1/28/00

EXHIBIT 4: Qwest ANS COBRA Pricing: 3Com Total Control Equipment Configuration (6/27/01)				
3Com TC/DC (HDM) CONFIGURATION (336 modem ports per chassis)				
Part No.	Description	Qty.	Virtual COBRA Price (US$)	COBRA Price (US$)
3C0504776-00	Total Control DC Mgmt. Chassis (per cabinet/rack of 4 modem chassis)	1	$ 1	$ 3,999
003458-00	*TCH Dual 130A/DC Power w/ HiPerNMC Card Set*	*1*	*Included*	*Included*
003802-01	*EdgeServer OverDrive, 256mb, 2x2GB HD*	*1*	*Included*	*Included*
003281-00	*16 port Serial NIC*	*1*	*Included*	*Included*
001893-00	*Pentium Pro Processor*	*1*	*Included*	*Included*
002157-01	*Dual 10/100 BaseT Ethernet NIC*	*1*	*Included*	*Included*
000849-12	*Quad Analog Digital Modem Card Set*	*1*	*Included*	*Included*
003458-00	TCH Dual 130A/DC Power w/ HiPerNMC card set (per modem chassis)	1	$ 1	$ 1,999
002106-01	HiperARC Card Set (Ethernet) (per modem chassis)	1	$ 1	$ 1,999
002092-00	HiPerDSP Card Set (24 ports/card) (per modem chassis)	14	$ 14	$ 30,870
Cisco7206/VXR	Cisco 7206 DC VXR (per 8 modem chassis) (T3 or 8xT1 card)	1	$ 1	$ 21,999
WS-C2924M-XL-EN-DC	Cisco 24-port DC NEBS switch	1	$ 1	$ 2,967
WCOM COBRA SW	WCOM 3Com-TC Custom Software Bundle (WCOM use only)	1	N/C	N/C
Total System Price	*(1 modem chassis per cabinet)*		$ 19	$ 63,833
Total System Price	*(2 modem chassis per cabinet)*		$ 35	$ 98,701
Total System Price	*(3 modem chassis per cabinet)*		$ 51	$ 133,569
Total System Price	*(4 modem chassis per cabinet)*		$ 67	$ 168,437

Pricing Notes

1. Average Lucent TNT COBRA price = $132.73 per port ($63,711/480). Average 3Com COBRA price (3 modem chassis) = $132.51 per port ($133,569/1008)
2. Virtual COBRA pricing ($1/part) valid only for RAS Equipment purchased by Qwest for use directly in support of WCOM's purchase of Virtual COBRA services from Qwest
3. Prices are exclusive of EF&I hardware and services (e.g., cabinets/racks, panels, cables, OOB mgmt devices, ancillary components, rack/stack services, and site preparation, engineering, and installation services and materials), which are the responsibility of Qwest
4. Cisco 7206 may use DS3, 4xDS1, or 8xDS1 cards (depending on egress capacity requirements from a given site)
5. Prices are exclusive of shipping, insurance, taxes, and duties, which are the responsibility of Qwest

AMENDED AND RESTATED EXHIBIT B
Verizon/WCOM CyberPOP™: 3Com Total Control Equipment Configuration (5/14/01)

3Com TC/DC (HDM) CONFIGURATION (336 modem ports per chassis)

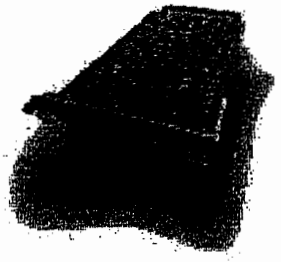
Part No.	Description	Qty.	Virtual COBRA Price (US$)
3C0504776-00	Total Control DC Mgmt. Chassis (per cabinet/rack of 4 modem chassis)	1	$1
003458-00	*TCH Dual 130A/DC Power w/ HiPerNMC Card Set*	*1*	*Included*
003802-01	*EdgeServer OverDrive, 256mb, 2x2GB HD*	*1*	*Included*
003281-00	*16 port Serial NIC*	*1*	*Included*
001893-00	*Pentium Pro Processor*	*1*	*Included*
002157-01	*Dual 10/100 BaseT Ethernet NIC*	*1*	*Included*
000849-12	*Quad Analog Digital Modem Card Set*	*1*	*Included*
003458-00	TCH Dual 130A/DC Power w/ HiPerNMC card set (per modem chassis)	1	$1
002106-01	HiperARC Card Set (Ethernet) (per modem chassis)	1	$1
002092-00	HiPerDSP Card Set (24 ports/card) (per modem chassis)	14	$14
Cisco7206/VXR	Cisco 7206 DC VXR (per 8 modem chassis)	1	$1
3C39036-DC or Cisco WS-C2924M-XL-EN-DC	3Com 3900 DC Ethernet Switch or Cisco 24-port DC NEBS switch (per cabinet/rack of 4 modem chassis)	1	$1
WCOM COBRA SW	WCOM 3Com-TC Custom Software Bundle (WCOM use only)	1	N/C
Total System Price			**$19**

Pricing Notes

1. Virtual COBRA pricing ($1/part) valid only for RAS Equipment purchased by Verizon for use in support of WCOM's purchase of CyberPOP service from Verizon
2. Prices are exclusive of EF&I hardware and services (e.g., cabinets/racks, panels, cables, OOB mgmt devices, ancillary components, rack/stack services, and site preparation, engineering, and installation services and materials), which are the responsibility of Verizon
3. The Cisco 7206 may use DS3, 4xDS1, or 8xDS1 cards (depending on egress capacity requirements from a given site)
4. For certain GridNet sites, a carrier access mux may be required to support DS3 ingress, subject to Verizon NEBS compliance
5. Prices are exclusive of shipping, insurance, taxes, and duties, which are the responsibility of Verizon
6. In light of 3Com's plans to "end of life" the 3Com 3900 DC Ethernet Switch, the Cisco 24-port DC NEBS Switch may be used instead

Total Control Platform with HiPer Access System Card Sets

HiPer DSP Card Set

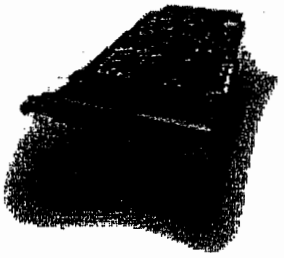


The advanced design of the HiPer DSP card set enables multiple modem sessions, ISDN processing, voice-codecs, and PPP co-processing on a single DSP (digital signal processor)—delivering a high level of functionality in a small space. The card set can process a T1/E1 span's worth of channels (24 or 30 channels respectively) while occupying just one platform slot.

In a fully populated Total Control platform, the HiPer DSP card set can handle up to 336 calls via T1 and up to 420 calls via E1.

Unlike a simple modem card, the HiPer DSP card set features a fully reprogrammable digital signal processing engine that lets administrators reconfigure the system to implement new technologies and applications such as voice-over-IP. The card set supports a full range of trunk and communications standards, including many variations of CAS/PRI 56K V.90*, 3Com x2*** technology, and all of the most common ITU-T and Bell communications standards and rates (including V.34, V.32terbo, V.32, and V.32bis, H.323-RTP and G.7231.1)

HiPer Access Router Card Set



The HiPer access router card set works with the HiPer DSP card set to process the packet content of digital and analog connections and route user data, at wire speeds, to various LAN/WAN interfaces.

The HiPer access router supports a broad set of LAN and WAN protocols and provides full access routing functionality, including per-user firewalls with application and protocol filtering, STAC compression, RIP and RIP Version 2, plus RADIUS and other user authentication support.

Occupying one slot each, two HiPer access router card sets can be configured to provide load sharing and redundancy for increased access router performance. Support for SNMP management, call activity logging and RADIUS accounting ensure a high level of oversight and control over network access activities.

Key Benefits

- Industry-leading call capacity ensures the best price/performance in the smallest footprint
- Flexible hardware and software architecture supports multiple services based on software configuration
- State-of-the-art RISC processors and distributed protocol support offer industry-leading performance even under extreme workloading

Specifications

Total Control Multiservice Access Platform

HiPer Access Router System

Power Requirements

Example of a Fully Loaded System: 96A max.

- 14 HiPer DSP NIC/NAC sets
- 2 HiPer access router NIC/NAC sets
- 1 Network Management NIC/NAC set

HiPer DSP NIC/NAC set: 5.4A max.

HiPer access router NIC/Ethernet NAC set: 7.0A max.

EdgeServer Pro card: 15A max

Network Management card: 5.0A max.

Physical Dimensions

Total Control Platform

Height: 8.75 in/ 22.2 cm

Width: 17.3 in/ 43.6 cm

Depth: 18.6 in/ 47.2 cm

Operating Environment

Temperature: 30°–104°F (0°–40°C)

Humidity: 0-95% noncondensing

Regulatory/Agency Approvals

Complies with FCC Part 15, Class A requirements for Radiated and Powerline Conducted Emissions

FCC Part 68 approved

NEBS Level 3 support

UL and C-UL (CSA equivalent) Listed under UL 1950, Information Technology Equipment

CE

HiPer DSP Card Set

Physical Interfaces

T1/T1-PRI and E1/E1-PRI:

One RJ-45 T1/E1 port

One RJ-45 RS-232-emulated connector for local management console

One Dual 1/8 in. bantam monitor jack (T1 version only)

Power Requirements

T1 NIC + 24 channel HiPer DSP NAC: 4.8A typical (24W)

E1 NIC + 30 channel HiPer DSP NAC: 5.2A typical (26W)

Primary Rate Interface Compliance

Compliant with AT&T technical publication TR41459 and compatible with AT&T ISDN PRI services

Laboratory Testing

ISDN data link layer ITU-T Q.921

ISDN call control signaling ITU-T Q931/I.451

Provides ANI and DNIS digits via Q.931 D-channel signaling

Supports NonFacility Associated Signaling (NFAS) with D-channel backup

E&M Type II Signaling (T1 interfaces)

Channelized T1 robbed bit signaling

Loop Start

Ground Start

E&M wink start

E&M immediate

E&M FGD

E&M FGB

T1 CR22

Central Office Switch Signaling Support (ISDN)

AT&T 4ESS Custom

AT&T 5ESS Custom

Northern Telecom DMS-100 Standard

Northern Telecom DMS-250

INS 1500

ER11

National ISDN 2 (NI2)

Digital Data Compatibility

For end-to-end transmission over ISDN: Sync PPP, ITU-T V.120/I.462, ITU-T V.110/I.463, 64 Kbps and 56 Kbps clear channel HDLC, X.75

T1/E1 Interface

Metallic interface per ANSI T1.403

CSU to T1 per AT&T Pub 62411

PRI interface per ANSI T1.408

D4 or ESF frame formats

B8ZS line coding

Auto equalization for data and clock recovery (36dB)

Supports local and remote loopbacks

E1 Interface

Metallic interface per ITU-T G.703

PRI interface per ETS 300 011

HDB3 line coding

ITU-T G.704 framing with and without CRC-4

Modulation Support

V.90 (56 Kbps*)

x2 (56 Kbps*)

V.34 (33.6 and 28.8 Kbps)

V.32terbo (19.2 Kbps)

V.32 (9600 and 4800 bps)

V.32bis (14.4 Kbps, 12 Kbps, 9600 bps, 7200 bps and 4800 bps)

V.22 (1200 bps)

V.22bis (2400 bps)

V.25

Bell 212A (1200 bps)

Bell 103

Error Correction

ITU-T V.42

MNP 2-4

Data Compression

ITU-T V.42bis

MNP 5

Voice Over IP (optional) CODEC Support

Line Echo Cancellation

ITU G.723.1

ITU-G.165

Protocols

ITU H.323

RTP

PPP

HiPer Access Router Card Set

Physical Interfaces

Dual, auto-sensing 10/100 Ethernet interfaces

Two RJ-45 10BASE-T/100BASE-T

One RJ-45 RS-232-emulated connector for local management console

Power Requirements

10/100 Ethernet NIC + HiPer access router NAC: 6.2A typical (31W)

Client Dial-Up Support

PPP with automatic PPP detection

SLIP, CSLIP

Telnet

DHCP

Rlogin

STAC compression

IP address pooling

Routing Support

RIP version 2

Transparent on-demand routing

IP protocol routing

Support for host, subnet, and network routers

Administration

Local flash ROM for booting and configuration storage

Support for Domain Name Service (DNS)

Call activity logging

SNMP management; MIB II and additional MIBs

Telnet command line interface

Ping utilities

Dial-in administrative access

RADIUS accounting

Filtering and Security

IP protocol filtering

Set inbound and outbound packet filtering independently

Compatible with RADIUS authentication servers

IP address assignment per router or per port

PPP Specific Features

STAC Data Compression for PPP payload

Address and control field compression

PAP and CHAP authentication protocols

Magic number loopback detection

Maximum receive unit negotiation

Async control character map negotiation

IP address negotiation and assignment

Van Jacobson compression TCP/IP headers

Industry Standards Support

ARP (Address Resolution Protocol)

CCP (compressed PPP) with support for STAC algorithms

CSLIP (compressed SLIP)

ICMP (Internet Control Message Protocol)

IP (Internet Protocol)

PPP (Point-to-Point Protocol)

RFC 1331, 1332, and 1334 for PPP

RIP (Routing Information Protocol) and RIP Version 2 with optional authentication

SLIP (Serial Line Internet Protocol)

TCP (Transmission Control Protocol)

Telnet

UDP (User Datagram Protocol)

CIDR

EdgeServer Pro Card

System Requirements

HiPer DSP card set, or Dual T1, E1, or PRI card set with Quad V.34 Modem cards

Power Requirements

15A max

Hardware Set

EdgeServer Pro NAC card (occupies 3 slots)

One or two** Intel® 200 MHz Pentium® Pro processors with 256 KB L2 cache

Two 2 GB internal mode 4 EIDE hard drives

Four ECC memory DIMM sites supporting up to 1 GB of memory. Four DIMMs may be installed in any combination in the following sizes: 64 MB, 128 MB, 256 MB

One 3.5" 1.44 MB floppy disk drive

Reset/Reboot button

EdgeServer Pro Peripheral NIC Card

Ultra-wide SCSI-3 interface

DB-15 SVGA video

Mini-DIN keyboard connector

Mini-DIN mouse connector

Optional Ethernet NIC Card

Two 10/100 Ethernet RJ-45 autosensing ports

One RJ-45 RS-232 serial port

EMI/EMC Regulatory

FCC Part 15, Class A; EN 55082; EN 55022, Class A

Safety

UL 1950; EN 60950; C-UL; CE-MARK

EdgeServer Operating System

Optional factory installed Windows NT Server 4.0

Server license and five client licenses

CD media

Getting Started documentation

Quad Modem Card

DTE Interface

Supports standard DTE rates up to 115,200 bps

Asynchronous operation

Synchronous operation (DCE supplies TxD clock)

Physical interface 1 SCSI-II 50-pin connector (converted via supplied cable to 4 EIA RS-232 25-pin female)

Error Correction

ITU-T V.42

MNP 2-4

DOJ - 00237
CONFIDENTIAL

4

3Com Total Control

Total Control Multiservice Access Platform

3Com Corporation
P.O. Box 58145
400 Bayfront Plaza
Santa Clara, CA 95052-8145
Phone: 1 800 NET 3Com
or 1 408 326 5000
Fax: 1 408 326 5001
World Wide Web:
www.3com.com

Asia Pacific Rim
Sydney, Australia: 61 2 9937 5000
Melbourne, Australia:
61 3 9866 8022
Beijing, China: 86 10 68492 568
Shanghai, China: 86 21 6350 1581
Hong Kong: 852 2501 1111
India: 91 11 644 3974
Indonesia: 62 21 572 2088
Osaka, Japan: 81 6 536 3303
Tokyo, Japan: 81 3 5977 3266
Korea: 82 2 3455 6900
Malaysia: 60 3 715 1333
New Zealand: 64 9 366 9138
Philippines: 632 892 4476
Singapore: 65 538 9368
Taiwan: 886 2 2 377 5850
Thailand: 662 231 8151 5

3Com Austria
43 1 580 17 0

3Com Benelux B.V.
Belgium: 32 2 725 0202
Netherlands: 31 346 58 62 11

3Com Canada
Calgary: 1 403 265 3266
Edmonton: 1 403 423 3266
Montreal: 1 514 683 3266
Ottawa: 1 613 566 7055
Toronto: 1 416 498 3266
Vancouver: 1 604 434 3266

3Com Eastern Europe/CIS
Bulgaria: 359 2 962 5222
Czech/Slovak Republics:
420 2 21845 800
Hungary: 36 1 250 83 41
Poland: 48 22 64513S1
Russia: 7 095 258 09 40

3Com France
33 1 69 86 68 00
Carrier and Client Access:
33 1 41 97 46 00

3Com GmbH
Berlin, Germany: 49 30 3498790
Munich, Germany: 49 89 627320

3Com Iberia
Portugal: 351 1 3404505
Spain: 34 1 509 69 00

3Com Latin America
U.S. Headquarters: 1 408 326 2093
Miami, Florida: 1 305 261 3266
Argentina: 54 1 312 3266
Brazil: 55 11 246 5001
Chile (also serving Bolivia and Peru):
56 2 633 9242
Colombia: 57 1 629 4847
Mexico: 52 5 520 7841/7847
Peru: 51 1 221 5399
Venezuela: 58 2 953 8122

3Com Mediterranee
Milan, Italy: 39 2 253011
Rome, Italy: 39 6 5279941

3Com Middle East
971 4 319533

3Com Nordic AB
Denmark: 45 4810 50 00
Finland: 358 9 435 420 67
Norway: 47 22 58 47 00
Sweden: 46 8 587 05 600

3Com Southern Africa
27 11 807 4197

3Com Switzerland
41 844 833 933

3Com UK Ltd.
Edinburgh: 44 131 240 2900
Ireland: 353 1 820 7077
Manchester: 44 161 873 7717
Marlow: 44 1628 897000

Data Compression
ITU-T V.42 bis
MNP 5

Compatibility
ITU-T V.90 at 56 Kbps*
x2 technology at up to 56 Kbps*
ITU-T V.34 at 33.6 Kbps, 31.2 Kbps, 28.8 Kbps and slower speeds
V.FC at 28.8 Kbps
V.32terbo at 19.2 Kbps
ITU-T V.32 bis at 14.4 and 12 Kbps; 9600; 7200 and 4800 bps
(symmetrical and asymmetrical full duplex)
ITU-T V.32 at 9600 and 4800 bps
ITU-T V.22 bis at 2400 bps
ITU-T V.22 at 1200 bps
ITU-T V.32 at 1200/75 bps
ITU-T V.21 at 300 bps
Bell 208B at 4800 bps (synchronous)
Bell 212A at 1200 bps
Bell 103 at 300 bps
QuickConnect technology
Adaptive Speed Leveling® (ASL)

Fax Compatibility
V.17 at 14,400 bps; Group III; TIA/EIA Class 1, and TIA/EIA 592 Class 2.0
Call detection automatically switches between data and fax calls

Symmetrical or Full Duplex Operation
Efficient 2-way transfers for full duplex protocols and instantaneous response for interactive applications

Synchronous Transmission
From 1200 bps to 28.8 Kbps for communication with mainframes, bridges, routers or other synchronous devices

Cellular Support (optional)
MNP10EC
V.42ETC

T1 Features
Telco T1 interface via T1 application card
Modem initialization string and ANI/DNIS code storage (3 sets)
DS0 busy out
ANI/DNIS code dependent modem configuration
Supports ground start and loop start supervision and E and M, Type 2
Supports MF and DTMF addressing

Physical Dimensions
Application Card: 12.45 in. x 6.4 in.
Application Card: 4.85 in. x 6.4 in.

Power Requirements
1.5A @ 5VDC
0.1A @ 12VDC
8.7 watts
25 BTUs

Dual PRI Card

Primary Rate Interface Compliance
Compliant to AT&T technical publication TR41459 and compatible with AT&T ISDN PRI services per AT&T Laboratories testing
ISDN data link layer ITU-T Q.921
ISDN call control signaling ITU-T Q.931/L451
Provides ANI and DNIS digits via Q.931 D-channel signaling
Supports NonFacility Associated Signaling (NFAS)

Central Office Switch Types Supported
AT&T 4ESS Custom
AT&T 5ESS Custom
Northern Telecom DMS-100 Standard
Northern Telecom DMS-250
INS 1500
National ISDN 2 (NI2)

Digital Data Compatibility
For end-to-end transmission over ISDN
ITU-T V.120/L462
ITU-T V.110/L463
Sync PPP (RFC 1717)

T1 Interface
Metallic interface per ANSI T1.403
CSU to T1 per AT&T Pub 62411
PRI interface per ANSI T1.408
D4 or ESF frame formats
B8ZS line coding
Integral CSU
- Auto equalization for data and clock recovery
- Range = 36dB at 772 Khz (6000 feet 24 AWG TP wire)

Supports local and remote loopbacks

LED Indicators
Run/Fail, Carrier, Loopback and Alarm status

Power/Heat
5 watts per card set/17 BTUs

Operating Environment
Temperature: 32°-104° F (0°-40° C)
Humidity: 0-95% (non-condensing)
Non-condensing

Physical Interfaces
RJ-48C T1/PRI connectors for span1 and span2
RJ-45 RS-232 connector for local management console
1/8 in. bantam monitor jacks

T1 Interface

Metallic interface per ANSI T1.403
CSU to T1 per ATT pub 62411
D4 or ESF frame formats
B8ZS line coding
Integral CSU
- Auto equalization for data and clock recovery
- Range = 36dB at 772 Khz (6000 feet 24 AWG TP wire)

Configurable E&M type II signal support including:
- Wink start or immediate start
- Answer Supervision
- Feature Group B, Feature Group D, and others
- DNIS and ANI address signaling

Supports ground start and loop start supervision
Supports MF and DTMF addressing
Supports local and remote loopbacks

Physical Interfaces
RJ48C connectors for span 1 and span 2 on T1 NIC
Bantam monitor jacks for span lines 1 and 2 on T1 NIC
RJ45 for local management console

LED Indicators
Run/Fail, Carrier, Loopback, and Alarm status

Power/Heat
5 watts per card set/17 BTUs

Operating Environment
Temperature: 32°-104° F (0°-40° C)
Humidity: 0-95% (non-condensing)

* Capable of receiving downloads at up to 56 Kbps and sending at up to 31.2 Kbps. 56K download capability requires compatible phone line and provider/host server equipment. Actual download speeds may be lower than 56 Kbps due to telecommunications regulations, varying line conditions, and other factors. This product complies with the 56K V.90 ITU standard and x2 technology. ITU standard ratification is expected in September 1998. See www.3com.com/56k for details.

**Visit www.3com.com for availability of drivers supporting second processor.

*** For our customers with existing x2 technology (and products upgraded to x2 technology), we guarantee a free upgrade to the V.90 standard. You must claim your free upgrade by December 31, 1998. See www.3com.com/56k for details.

To learn more about 3Com products and services, visit our World Wide Web site at http://www.3com.com.

Printed in U.S.A. on recycled paper

400426-001 6/98

DOJ - 00238
CONFIDENTIAL

5

Read product information for the 3Com CommWorks Total Control HiPer Access Router Card (002106-01)

This product is currently not available for purchase at any of the stores we search

> See product details
> Write a review at Epinions.com

The HiPer Access Router Card Set is a complete solution for Internet service providers, telcos and large corporate networks that require high-performance routing technology. The HiPer Access Router Card is part of the HiPer Access System and is used in conjunction with HiPer DSP Cards to form a complete solution for unparalleled remote access performance. The HiPer Access Router Card supports and routes 336 analog or ISDN dial-up calls via T1 or T1-PRI connections, or 420 analog or ISDN dial-up calls via E1 or E1-PRI connections. Two HiPer

DOJ - 00239
CONFIDENTIAL

Access Router Cards may be configured in a single Total Control HiPer Access System to provide statistical redundancy for increased routing performance.

Standards and Protocols

Management Protocol	SNMP

Miscellaneous

MPN	002106-01
Product ID	20194173

Additional resources

Router Technology
Free e-Book download: "Architecting Next-Generation Networks"
www.gobroadcom.com

Routers at Amazon.com
' ow prices and huge selection. Qualified orders over $25 ship free
.mazon.com/tools

Broadband Router
Broadband Networking at Dell
www.dell4me.com

Hubs, Routers, & Switches
Top Brands new/used/refurb with up to 90% off retail w/ warranty.
www.networkliquidators.com

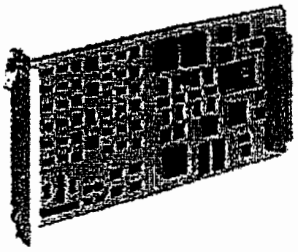
Routers at Best Buy
Shop Best Buy today for the latest Routers & more networking products!
www.BestBuy.com

ebay Search for 002106 01

DOJ - 00240
CONFIDENTIAL

Read product information for the 3Com Total Control 1000 HiPer DSP Card Set (002092-00) Modem

This product is currently not available for purchase at any of the stores we search



The advanced design of the HiPer DSP card set enables multiple modem sessions, ISDN processing, voice-codecs, and PPP co-processing on a single DSP (digital signal processor)-delivering a high level of functionality in a small space. The card set can process a T1/E1 spans worth of channels (24 or 30 channels respectively) while occupying just one platform slot. In a fully populated Total Control 1000 platform, the HiPer DSP card set can handle up to 336 calls via T1 and up to 420 calls via E1. Unlike a simple modem card, the HiPer DSP card set features a fully reprogrammable digital signal

> See product details
> Write a review at Epinions.com

DOJ - 00241
CONFIDENTIAL

8

processing engine that lets administrators reconfigure the system to implement new technologies and applications such as voice-over-IP. The card set supports a full range of trunk and communications standards, including many variations of CAS/PRI 56K V.90, 3Com x2 technology, and all of the most common ITU-T and Bell communications standards and rates (including V.34, V.32terbo, V.32, and V.32bis...

Key Features

Type	ISDN Terminal Adapter
Connectivity Technology	Wired
Platform	PC

Protocols

Analog Modulation	ITU V.34, ITU V.32bis, ITU V.32, ITU V.17, ITU V.22bis, ITU V.22, ITU V.90, ITU V.21, Bell 212A, Bell 103, Bell 212, Bell 208B
Error Correction	ITU V.42, MNP-4, MNP-3, MNP-2
Data Compression	ITU V.42bis, MNP-5
Digital Signaling	ISDN PRI

Other Features

56K Technology	V.90, X2

Warranty

Warranty	2 Years

Miscellaneous

Package Qty.	1
MPN	002092-00
Product ID	20162023

DOJ - 00242
CONFIDENTIAL

9

Read product information for the Cisco 7206 VXR Router (C7206VXR/400/2FE)

Enterprise and service provider customers continue to drive the need for . optimizing operational and management costs, simplifying network management and increasing revenue opportunities. The Cisco 7200 addresses these requirements by collapsing functions previously performed by separate devices into a single, cost-effective platform. Through functional integration, the Cisco 7200 high-performance multifunction platform provides a single, cost-effective platform.The Cisco 7200 series delivers exceptional price/performance to meet the requirements of both enterprise and service providers. With its combination of

DOJ - 00243
CONFIDENTIAL

10

scalable performance, density, and low per-port pricing, the Cisco 7200 allows network-layer capabilities to be extended to a much wider range of network configurations and environments. Customers can now gain the advantages of high-performance network-layer switching and services, including security, QoS, and traffic management to more locations throughout the network.Th...

Standards and Protocols	
Management Protocol	SNMP, Telnet
Memory	
Installed RAM	128 MB
Installed Flash Memory	48 MB
Dimensions	
Width	16.82 in.
Depth	17.02 in.
Height	5.24 in.
Weight	50.05 lb.
Miscellaneous	
MPN	C7206VXR/400/2FE
Product ID	20218090

> Compare prices on the Cisco 7206 VXR Router (C7206VXR/400/2FE)

Additional resources

Routers
Secure & assured routing solutions for large scale networks. Reliable.
www.juniper.net

Routers at Amazon.com
ow prices and huge selection. Qualified orders over $25 ship free
Amazon.com/tools

DOJ - 00244
CONFIDENTIAL

AMENDED AND RESTATED EXHIBIT A
Verizon/WCOM CyberPOP™: Lucent TNT Equipment Configuration (5/14/01)

T1/DC CONFIGURATION (480 modem ports per chassis)

Part No.	Description	Qty.	Virtual COBRA Price (US$)
TNT-2DC-H	TNT Chassis, Shelf Controller, Dual DC Power, 19" Rack Mount Kit, 32 MB DRAM, 32MB Flash Memory, and Heat Baffle.	1	$1
TNT-SL-48MODV3-S-C	48-Port Modem Card (V.90 and V.34 compatible)	10	$10
TNT-SL-HDLC2	96 Channel HDLC Slot Card	1	$1
TNT-SL-CT1	T1 Slot Card	3	$3
WCOM COBRA SW	WCOM TNT Custom Software Bundle (WCOM use only)	1	N/C
Total System Price			**$15**

Pricing Notes

1. Virtual COBRA pricing ($1/part) valid only for RAS Equipment purchased by Verizon for use In support of WCOM's purchase of CyberPOP service from Verizon

2. Prices are exclusive of EF&I hardware and services (e.g., racks, panels, cables, OOB mgmt devices, ancillary components, rack/stack services, and site preparation, engineering, and installation services and materials), which are the responsibility of Verizon

3. In lieu of the ten (10) TNT-SL-48MODV3-S-C modem cards, five (5) APX8-SL-96DSP modem cards may be used for new deployments in accordance with mutually-coordinated configuration changes.

4. Prices are exclusive of shipping, insurance, taxes, and duties, which are the responsibility of Verizon

UUNET/QWEST COBRA SERVICE SCHEDULE: EXHIBIT 2

Lucent T1 / DC TNT (Fully Loaded @ 480 Ports + 1 extra/free T1 Slot Card)

Price excludes shipping, insurance, and taxes, which are the responsibility of Qwest.

Special Quantity Discount				82.0%		
Part No.	**Qty.**	**List Unit Price**	**List Ext. Price**	**Disc. (%)**	**Unit Disc. Price**	**Disc. Ext. Price**
TNT-2DC-H	1	$ 25,750	$ 25,750	82.0%	$ 4,635	$ 4,635
TNT-SL-48MODV3-S-C	10	$ 27,600	$ 276,000	82.0%	$ 4,968	$ 49,680
TNT-SL-HDLC2	1	$ 9,600	$ 9,600	82.0%	$ 1,728	$ 1,728
TNT-SL-CT1	3	$ 9,200	$ 27,600	82.0%	$ 1,656	$ 4,968
TNT-SL-CT1	1	$ 9,200	$ 9,200	100.0%	$ -	$ -
TNT-SO-FR	1	$ 4,000	$ 4,000	82.0%	$ 720	$ 720
TNT-SO-ISDN	1	$ 4,000	$ 4,000	82.0%	$ 720	$ 720
TNT-SO-L2TP	1	$ 7,000	$ 7,000	82.0%	$ 1,260	$ 1,260
Total TNT Price			**$ 363,150**			**$ 63,711**
Qwest Purchase Commitment (# TNTs)						480
Qwest Purchase Commitment (Total $)						$ 9,113,280

Lucent Technologies
Bell Labs Innovations

Frequently Asked Questions
TAOS 9.0 for MultiVoice™

1. ***What is the True Access Operating System (TAOS)?***

   The True Access™ Operating System (TAOS) from Lucent Technologies is the multiservice, real-time operating system software embedded in the APX 8000™, Stinger™, MAX TNT®, MAX™, SuperPipe, and Pipeline® family of access platforms. TAOS provides the widest range of solutions for WAN access environments and represents the brand name for the leading WAN access feature set for service providers and corporate enterprises. TAOS underlines the Lucent heritage in WAN access solutions and its commitment to research and development to ensure continued leadership in the market.

2. ***What edge access platforms does TAOS 9.0 for MultiVoice support?***

   TAOS 9.0 for MultiVoice™ supports the following industry-leading access platforms:

   APX 8000, MAX TNT, and MAX 6000. Lucent plans to support the MAX 3000 and SuperPipe Plus in the second quarter of 2001 in TAOS version 9.1.

3. ***What are the major features within TAOS 9.0 for MultiVoice?***

   TAOS 9.0 for MultiVoice is a major release that enables "Universal Port" capabilities on the APX 8000 and MAX TNT platforms. Universal Port supports multiple applications including simultaneous analog and digital modems for remote access, voice- and fax-over-IP, and virtual private networks (VPNs) using any available port processor resources on the 96- or 48-port MultiDSP modules.

   Specific MultiVoice features include application support for residential 1+ long distance (LD) and 1010 dial-around services, and call routing programmability in and out of the voice-over-IP (VoIP) network based on dialed number identification service (DNIS) or trunk group. In 2-stage dialing scenarios (calling card), you can implement programmability for authentication and routing based on Automatic Number Identification (ANI), DNIS, trunk group, and/or password. Other features include custom branding (announcements), arbitrary break-in announcements, sequential dialing, and support for operator assistance/calling card balance recharge. **Please note that 1+ LD and 1010 dial-around services require Feature Group D support that is available only in North America and other select regions.**

4. ***What is "Universal Port"?***

   "Universal Port" functionality enables the MAX TNT and APX 8000 platforms to configure the digital signal processor (DSP) automatically for the type of incoming call—dial-up (V.90 modem or ISDN), VoIP, fax-over-IP, and virtual private network (VPN)— accommodate it on any available port, and process it for transport over a packet-based IP network. **Please note that "Universal Port" is not supported on the MAX 6000 or MAX 3000 at this time.**

5. ***Which slot cards support "Universal Port" with the MAX TNT and APX 8000 platforms?***

   The 48-port MultiDSP slot card(s), and the 96-port MultiDSP card(s) are needed to support the "Universal Port" feature. Part numbers are as follows:

   - 48-port MultiDSP cards (TNTV-SL-ADI-C)
   - 96-port MultiDSP cards (APX8-SL-96DSP)

DOJ - 00247
CONFIDENTIAL

14

6. ***Can the same chassis house the 48-port MultiDSP and 96-port MultiDSP slot cards?***

   As of TAOS 9.0, you may mix the 48- and 96-port MultiDSP cards in a single chassis for data applications only—that is, you can mix them for V.90, ISDN, VPN, etc., but not when running a VoIP service at this time.

7. ***Are there any limitations of the 96-port MultiDSP vs. the 48-port MultiDSP?***

   Yes, the 96-port MultiDSP card can be used as a modem or a voice coder. This card supports G.711 and G.729 (a) only. In addition, every port can support fax-over-IP, either as transparent fax transport (carried as G.711 PCM with no echo cancellation) or fax relay (T.38 based). The 48-port MultiDSP card supports analog and digital modems, fax-over-IP, and all supported MultiVoice codecs including G.711, G.729a, G.723.1, G.728, and RT-24.

8. ***How do I upgrade TAOS on an existing MAX TNT or APX 8000 platform with MultiVoice hash code? Is there a charge to obtain the software?***

   The software is free to existing MultiVoice customers. To obtain the software and release information, go to the following URLs:

   MAX TNT: ftp://ftp.ascend.com/pub/Software-Releases/MaxTNT/
   APX 8000: ftp://ftp.ascend.com/pub/Software-Releases/APX/

7. ***Can I upgrade my existing remote access concentrator for the MAX TNT and APX 8000 platforms to support MultiVoice TAOS 9.0 with "Universal Port?" and is there a cost?***

   Yes, you need the following components to create and contribute to the programmability of the MultiVoice with the "Universal Port" solution:

   - MultiVoice Hash Code
   - MultiVoice Access Manager 3.1 (MVAM 3.1) or Lucent Softswitch 3.0
   - Lucent Worldwide Services for MultiVoice Networks
   - Add-on applications from Lucent or a MultiVoice approved third-party vendor (see http://www.lucent.com/ins/map) *(Optional)*
   - MultiVoice Settlement Engine 1.0 *(Optional)*
   - Either 48- or 96-port MultiDSP cards to support VoIP, fax-over-IP, and all data applications.

   You are also required to install the Feature Group D hash code option on each gateway that will support interexchange carrier (IXC) traffic in a MultiVoice network using the MultiVoice Access Manager 3.1 as the gatekeeper.

   The Lucent sales force and technical support teams are available to answer questions and assist you with information and pricing regarding your existing network and business needs. For additional support, you may also contact certified Lucent distributors and system integrators directly or go to the Lucent Web site at (http://www.lucent.com/ins/products/multivoice) for more information on the MultiVoice for the MAX product.

10. ***If I decide not to upgrade to TAOS 9.0, will Lucent still support the older versions of TAOS?***

    Yes, but you should consider upgrading to version 9.0 for its enhanced features, performance and functionality—and it is FREE!

DOJ - 00248
CONFIDENTIAL

15

11. What are the benefits of TAOS 9.0 for MultiVoice?

The "Universal Port" feature uses the same DSP for voice or data on a call-by-call basis, which allows you to use the APX 8000 and MAX TNT products as multiservice platforms. Lucent is the first to offer Universal Port capability on platforms with multiple DS3 capacity. Multiservice networks provide the key to reduced costs, and are targeted to provide network service providers with a common platform that they can use for transparent integration of voice, fax, and modem services in an existing or new carrier infrastructure.

Other benefits include the ability to sell multiservice capability on a single platform into lucrative calling card, dial-around, and long distance markets. MultiVoice can now be deployed— where, until now, a Class 4 tandem switch was required—to trunk long-distance (LD) calls in intra-LATA or interLATA switching environments. Supported applications include residential 1+ LD and 1010 dial-around services. This new MultiVoice functionality enables any Internet service provider (ISP) to offer telephony services in the $87 billion North American market for long-distance services.

12. When will TAOS 9.0 be available?

TAOS 9.0 is available now. You can download the software from the following URLs:

MAX TNT: ftp://ftp.ascend.com/pub/Software-Releases/MaxTNT/
APX 8000: ftp://ftp.ascend.com/pub/Software-Releases/APX/

13. Does TAOS 9.0 for MultiVoice operate with Lucent Softswitch and what type of applications does it support?

Yes, TAOS 9.0 does interoperate with Lucent Softswitch 2.x, 3.0, and above.

The initial application of Lucent Softswitch 3.0 is to replace the toll/tandem (class-4) switches and to offer VoIP connectivity. Lucent Softswitch controls trunking gateways like the MAX-TNT and APX-8000, which convert circuit trunks to VoIP packets. Lucent Softswitch receives the SS7 signaling from the PSTN by an embedded SS7-Gateway and performs call control functions. This solution allows operators to replace existing toll/tandem exchanges with a Lucent Softswitch + gateway combination distributed in a network. Being a flexible signaling infrastructure, Lucent Softswitch offers voice over packet connectivity with a variety of technologies.

Another application includes Internet Call Diversion (ICD) which diverts Internet dial-up data traffic directly to the data packet network to alleviate congestion on the circuit based PSTN. This application has been the driving force behind the evolution of gateways we know today and has accelerated the clarification of the Lucent Softswitch architecture by separating payload and call-control. For further information on Lucent's Softswitch product go to

http://www.lucent-ssg.com/ons/softswitch/

Does NavisAccess™ v5.0 support TAOS 9.0 for MultiVoice?

Yes, with Navis™ 5.0 and MultiVoice, you can use the VoIP gateway Management Information Base and call logging to manage the VoIP network and application. You can map VoIP calls based on DNIS and Trunk Group and monitor VoIP services in real-time using NAVIS AccessWatch. You can also monitor physical resources including DSPs, slot cards, and modems and base fault, performance and event monitoring on VoIP statistics—jitter, delay/latency, and call rates. You can purchase the NavisAccess management platform separately.

DOJ - 00249
CONFIDENTIAL

16

14. How can I purchase the TAOS 9.0 and where can I get additional information?

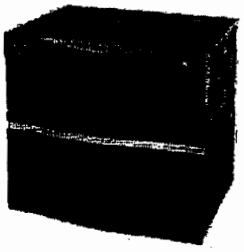
You may purchase the MultiVoice TAOS 9.0 for the APX 8000 and MAX TNT platforms via the standard MAX distribution channels including the following:

- Distributors
- Value-added reseller (VAR) channels
- Direct from Lucent

For more information, please call Lucent in the U.S. at 1.800.621.9578 or visit our Web site at http://www.lucent.com/ins/products/multivoice.

Read product information for the Lucent MAX TNT (TNT-2DC-H) Remote Access Server

This product is currently not available for purchase at any of the stores we search



The MAX TNT multiprotocol WAN access switch enables carriers, ISPs, corporations, and major network providers to offer a variety of access services such as analog, ISDN, leased T1/E1, and frame relay. Because the MAX TNT is the highest-density product in its class, it dramatically reduces rack space requirements while driving down the price per port.The MAX TNT has a scalable, modular card and backplane architecture that provides intelligent access for applications to global network services. The modular card system lets users design a solution that

satisfies the specific application and bandwidth requirements of any customer.

Key Features

Connectivity	Cable
Platform	PC

Protocols

Data Link Protocol	Fast Ethernet, Ethernet
Remote Management Protocol	SNMP
Transport Protocol	TCP/IP

Other Features

Moduls Qty.	0
Package Qty.	1

Dimensions

Width	17.41 in.
Depth	11.5 in.
Height	14.03 in.
Weight	130.1 lb.

Miscellaneous

MPN	TNT-2DC-H
Product ID	20205182

Additional resources

19

DOJ - 00252
CONFIDENTIAL

Read product information for the Lucent (TNT-SL-48MODV3-S-C) Modem

Each Series56 Digital Modem module supports both analog and cellular connections at speeds up to 56 Kbps. It has 48-port Digital Modems (DM48) and occupies two expansion slots on the MAX TNT. Remote users with a modem and an analog or cellular line can dial into the MAX TNT over T1, DS3 or T1/E1/PRI lines.

> See product details
> Write a review at Epinions.com

Key Features

Type	Modem (Digital)
Max. Transfer Rate	56 Kbps
Connectivity Technology	Wired
Platform	PC

Protocols

Analog Modulation	ITU V.34, ITU V.32bis, ITU V.32, ITU V.17, ITU V.22bis, ITU V.29, ITU V.22, ITU V.90, ITU V.27ter, ITU V.21, ITU V.23, Bell 212A, Bell 103, K56Flex, ITU V.34bis, ITU V.33, Bell 212

10

DOJ - 00253
CONFIDENTIAL

Error Correction	ITU V.42, MNP-4, MNP-3, MNP-2, MNP-10, MNP-10EC
Data Compression	ITU V.42bis, MNP-5
Digital Signaling	ISDN PRI

Other Features

Max. Fax Transfer Rate	14.4 Kbps
56K Technology	V.90, K56Flex

Dimensions

Depth	1.62 in.
Height	8.67 in.
Width	10.99 in.

Miscellaneous

Package Qty.	1
MPN	TNT-SL-48MODV3-S-C
Product ID	20163035

Additional resources

Comcast High-Speed
Internet. 1st 6 mos for $19.99 Free Modem & $50 Cash Back!
www.comcastoffers.com

Modem Blaster V.92 PCI
With Speakerphone Networking at Dell
www.dell4me.com

Modems at Staples
Save on modems, memory and other computer accessories.
www.staples.com

Modems
Huge selection of Modems We Ship Over 13,000 Orders a Day!
www.newegg.com

All Your Computer Needs
Hardware, Software, Accessories. Thousands of items to choose from.
listings.ebay.com

ebay Search for modem

DOJ - 00254
CONFIDENTIAL

21

Read product information for the Lucent (TNT-SL-HDLC2) Expansion Module

This HDLC slot card has identical functionality to TNT-SL-HDLC2 with hardware support for encryption included (requires software option for encryption).

> See product details
> Write a review at Epinions.com

Key Features	
Form Factor	Plug-In Module
Interface	Expansion Slot
Connectivity	Cable
Other Features	
Package Qty.	1
Miscellaneous	
MPN	tnt-sl-hdlc2
UPC	000001224689
Product ID	22208116

Additional resources

DOJ - 00255
CONFIDENTIAL

22

Read product information for the Lucent (TNT-SL-CT1) Expansion Module

This product is currently not available for purchase at any of the stores we search

Lucent gives its customers a unique opportunity to configure their network equipment the way the want it to be. By providing various network modules, Lucent satifies the needs of most demanding users and gurantees that its modules are fully compatible with their parent systems and deliver outstanding results.

> See product details
> Write a review at Epinions.com

Key Features

Data Transfer Rate	1.5 Mbps
Form Factor	Plug-In Module
Connectivity	Cable
Cabling Type	Network
latform	PC

Other Features

DOJ - 00256
CONFIDENTIAL

23

Package Qty.	1
Miscellaneous	
MPN	TNT-SL-CT1
Product ID	20619944

Additional resources

Expansion Modules
Find your Expansion Modules and have it ship today!
www.alliedelec.com

D/Dock Expansion Station
For Select Dell Latitude Dell
www.dell4me.com

DSX-1 Expansion Module
For the TSU Technology at Staples
www.Staples.com

Find It For Sale
Low Priced Expansion Modules. Huge Selection! (aff)
ebay.com

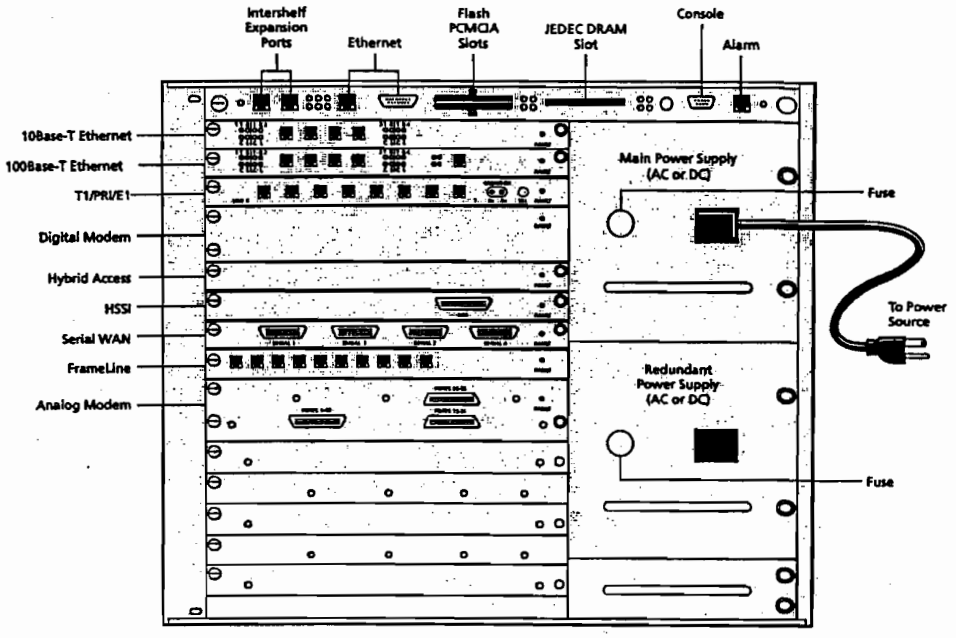
Kit [Expansion Module]
Matrix/Stacking Module Network- Modules at DirectDial
www.DirectDial.com

ebay Search for TNT SL CT1

DOJ - 00257
CONFIDENTIAL

24

MAX TNT Back Panel Options



Hardware Specifications

Height
14 in. x 17.4 in. x 11.5 in.
(35.6 cm x 44.2 cm x 29.2 cm)

Weight
130 lbs., with 672 modems (single power supply)
27.2 lbs. empty (no power supplies)

LAN Interface
Ethernet 10 BaseT, 100 BaseT

WAN Interfaces
DS3, T1/E1, Serial (V.35, RS449, X.21)
ATM DS3, STM-0 for Japan only

Software Upgrade
Via built-in flash RAM, remote downloadable

Power Requirements
950 watts, 47-63 Hz, 90-240 VAC, -40 to -60 VDC

Operating Requirements
Temperature:
32-104°F (0-40°C)

Altitude:
0-14,800 ft. (0-4500 meters)

Relative Humidity:
0-90% (noncondensing)

Safety Certifications
CSA 950, NTRL/UL 1950,
TUV EN 60 950
EMI/RF
FCC Part 68, FCC Part 15, E55081-1, N50082-1, EN55022

Software Specifications

Network Protocols Supported
TCP/IP

Routing Protocols Supported
RIP, RIP2, OSPF, IGMP multicast forwarding

LAN Protocols Supported
Ethernet 10 BaseT, 100 BaseT

WAN Protocols Supported
PPP, ARAP, SLIP, C-SLIP, Async PPP, Sync PPP, HDLC, ARA, X.25 PAD, X.25 over B-channel, V.120, D4 framing (T1/E1), G703/732 framing (R1), R2, frame relay PVC, Hybrid Access, PPP-FR gateway, FR NNI, ATM (UNI and NNI)

VoIP Protocols Supported
H.323, IPDC

Modem
V.90, K56flex, V.34, MNP5, V.42bis, fax modem send up to 14.4 Kbps

Bandwidth Management
Multilink PPP, Multilink Protocol Plus, TCP header compression, data compression Lucent /Microsoft/STAC V9)

Security
Lucent NavisRadius, PAP, CHAP, token card, CLID, packet filtering, SNMP, console management (VT-100), PPP callback, user authentication

Management
NavisAccess network management, console management software (runs on Windows 95 and Windows 3.x)
Telnet, NASI, SNMP II, PPP LQM, frame relay ITU Annex A, frame relay ANSI

Annex D

Client Software

IntragyAccess software

DeskDial client software

To learn more, contact your Lucent Technologies Representative, Authorized Reseller, or Sales Agent. Or, visit our Web site. www.lucent.com

Specifications subject to change without notice.

ISO 9001 REGISTERED

Lucent Technologies
Bell Labs Innovations

DOJ - 00258
CONFIDENTIAL

25

Jeff Saltzberg

From: Shoeb Siraj [shoeb.siraj@mci.com]
Sent: Wednesday, February 09, 2005 7:17 AM
To: 'Jeff Saltzberg'
Cc: Nancy.S.McCarty@mci.com; John.Anderson@mci.com
Subject: FW: DAN Platform

Jeff:

Response from the Director of Engineering at Lucent.

Thanks,

~Shoeb.

-----Original Message-----
From: Don Krause [mailto:dk@lucent.com]
Sent: February 08, 2005
To: Shoeb Siraj
Subject: RE: DAN Platform

Hi Shoeb,

I'm having a hard time finding any Marketing literature on the CSM cards. This literature would have been generated in the 1999-2000 timeframe and it no longer seems to be available.

Nonetheless, the two modem cards are Conexant based modem cards. Support for these cards ends with 10.1. They support modem protocols up to and including V.90, but do not support 92. Voice is not supported on either of these cards.

The HDLC card terminates HDLC sessions over ISDN calls. In addition, it can be used in Frame Relay applications. This card is still supported. Please refer to our release notes for the details on the applications of these cards.

Release notes can be found at:

http://www.lucent.com/products/relmatlisting/comp/listing/1,,SOID+1334-LOCL+1-DOC_ID+111-PNUM+1-PGID+0-ORIG+s,00.html

Thanks, Don

Don Krause Lucent Technologies http://www.lucent.com/ins
mailto:dk@lucent.com Voice: 510.747.6793 FAX: 510.747.5411
Mobile: 510.552.6573 Pager: mailto:5105526573@vtext.com

DOJ - 00259
CONFIDENTIAL

26

EXHIBIT D

U.S. Department of Justice

United States Attorney
Southern District of New York

86 Chambers Street, 3rd Floor
New York, New York 10007

February 14, 2005

BY EMAIL AND MAIL
James Grogan
Weil Gotshal & Manges, LLP
700 Louisiana St, Ste. 1600
Houston, Texas 77002

Re: In re WorldCom, 02-13533 (AJG)

Dear Mr. Grogan:

We write concerning the Reorganized Debtors' Objection to Proof of Claim No. 38365 (the "Objection"), filed on August 5, 2004. The IRS's Proof of Claim relates to excise tax claims incurred by debtor UUNET.

As we have discussed, we believe it would be useful for MCI and UUNET informally to provide documents to the IRS to see if there is a way to reach resolution of this claim without Court intervention. Accordingly, we have put together the following list as our initial informal document request. We may seek additional documents hereafter.

For all the documents sought below, the relevant time frame is the fourth quarter of 2002 through the present. (The tax periods identified in Proof of Claim No. 38365 are the fourth quarter of 2002, all four quarters of 2003, the first quarter of 2004, and some of the second quarter of 2004, but since this is post-petition, ongoing claim, we believe it makes sense to include in our request all documents through today, and would ask MCI and UUNET to consider this request as an ongoing request for updated information).

The IRS requests that MCI and UUNET provide the following documents:

1. All billing invoices relating to network services and communications services provided by UUNET.

2. All billing invoices relating to network services and communications services purchased by UUNET or to which UUNET subscribed.

3. All contracts and/or tariffs governing network services and communications services provided by UUNET, including all contracts between (a) UUNET and its customers;

(b) UUNET and its suppliers; and (c) UUNET and its communications providers.

4. All documents concerning the network architecture and/or system topology of UUNET's systems, including its COBRA-based systems, including but not limited to blueprints, diagrams, schematics or other descriptive documents.

5. All documents reflecting what transmission lines are used by UUNET to connect their network services to customers and suppliers, and how those transmission lines are used.

6. All documents concerning the specifications for the equipment used by UUNET.

7. All promotional materials produced or used by UUNET describing the functions and capacities of its communications systems.

8. All promotional materials received by UUNET from suppliers describing the functions and capacities of its communications systems.

The Government makes these requests as part of informal discussions between MCI, UUNET and the IRS, pursuant to Federal Rule of Evidence 408. In doing so, the Government does not waive, and expressly hereby reserves, its right to engage in all aspects of formal litigation, including motion practice, discovery, and trial, should the parties' informal efforts fail to achieve resolution of this claim.

Please let us know when MCI and UUNET will be able to provide us with responsive materials.

Sincerely yours,

DAVID N. KELLEY
United States Attorney

By: _____
DANNA DRORI
NICOLE GUERON
Assistant United States Attorneys
Telephone: (212) 637-2699; 637-2689
Facsimile: (212) 637-2686

EXHIBIT E

Tutorial on methods of dial-up access to ISPs

I. The components of a dial-up connection - a tutorial

1. The structure of a dial-up connection has evolved over the years in order to take economic advantage of new services and pricing structures. Nonetheless, all the techniques described below share the common feature that a dial-up customer connected to Public Switched Telephone Network (PSTN) can establish a telephonic quality connection with a Modem or Digital Signal Processor serving the Internet Service Provider (ISP).

2. A Modem is a device which converts digital information to a telephonic quality voice signal and vice versa. A Digital Signal Processor converts digital representations of telephonic quality voice signals to alternative digital representation and vice versa. In the applications described in this tutorial, the alternative digital representations are typically in a format using Internet Protocol (IP)

Basic connection

3. The basic connection is shown in Figure 1

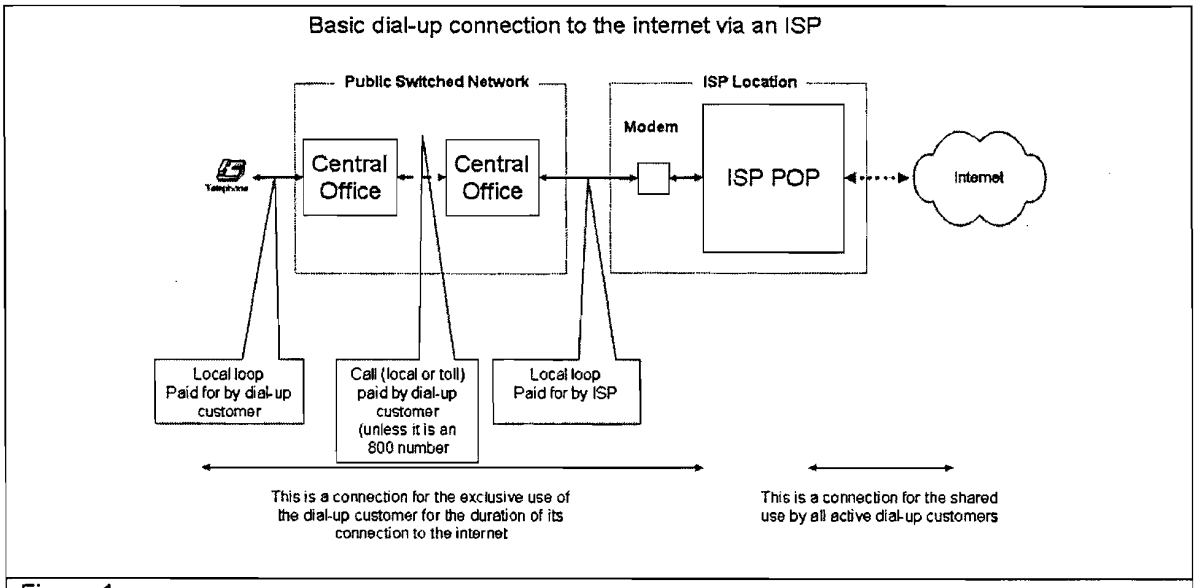


Figure 1

4. The dial-up customer is connected to the local telephone company by a local loop which is connected to their Central Office. The Central Office provides dial tone. The cost of this loop (and any associated taxes) is included in the dial-up service cost to the dial-up customer and paid by the dial-up customer.

5. The dial-up customer may dial any telephone number and (subject to any service restrictions) be connected to any other telephone in the world. The charges for such calls will be deemed local or toll and subject to Federal Excise Tax (also known as FET). In a traditional domestic telephone call, dial-up customer both the person placing the call and the person receiving the call pay Federal Excise Tax.

6. Any dial-up customer connected to the Public Switched Telecommunications Network (PSTN) can establish a telephone quality connection with a modem associated with the ISP. Telephone quality is required to interact with the dial-up customer's modem.

7. Therefore, as is undisputed in this case, the local loop associated dial-up access to the ISP is subject to FET and any calls charges are subject to FET because the calls are either Local or Toll. In general, these call charges are paid by the ISP. ISPs usually establish 800 type numbers for the convenience of customers who do not have local access to one of their phone numbers. The charges for these 800 type calls are paid for by the ISP. These charges are liable to FET as they are defined as either Local or Toll.

8. In practice, an ISP creates modem pools consisting of groups of 24 modems. In a simplistic arrangement (see Figure 2), such a pool would require 24 local loops (all of which attract FET).

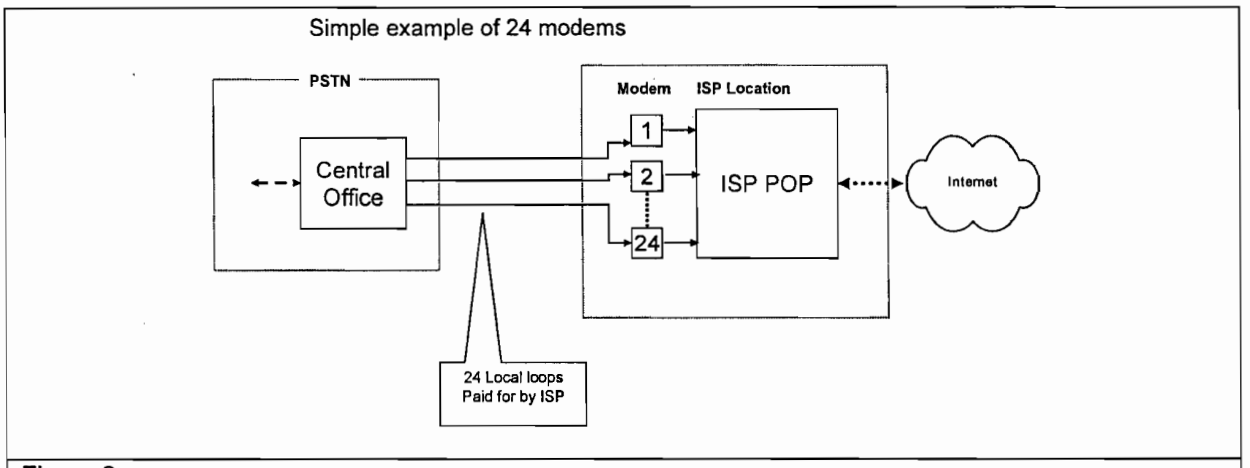


Figure 2

Use of Channelized DS1

9. In practice, the ISP would order a Channelized DS1 which uses a single circuit to carry 24 voice calls (see figure 3). In general, a DS1 (and any associated multiplexors) is cheaper than 24 individual circuits.

10. When a voice channel in the public telephone system is converted to a digital representation, it normally requires 56 or 64 kbps. A channelized DS1 will carry 24 of these voice channels giving a composite speed of about 1.5 Mbps. DS1s can also be referred to as T1s. Within the telephone network 28 DS1s are combined to produce a DS3 circuit giving a composite speed of about 45 Mbps. In practice, there are many more levels of this hierarchy with speeds of up to 2,000 Mbps.

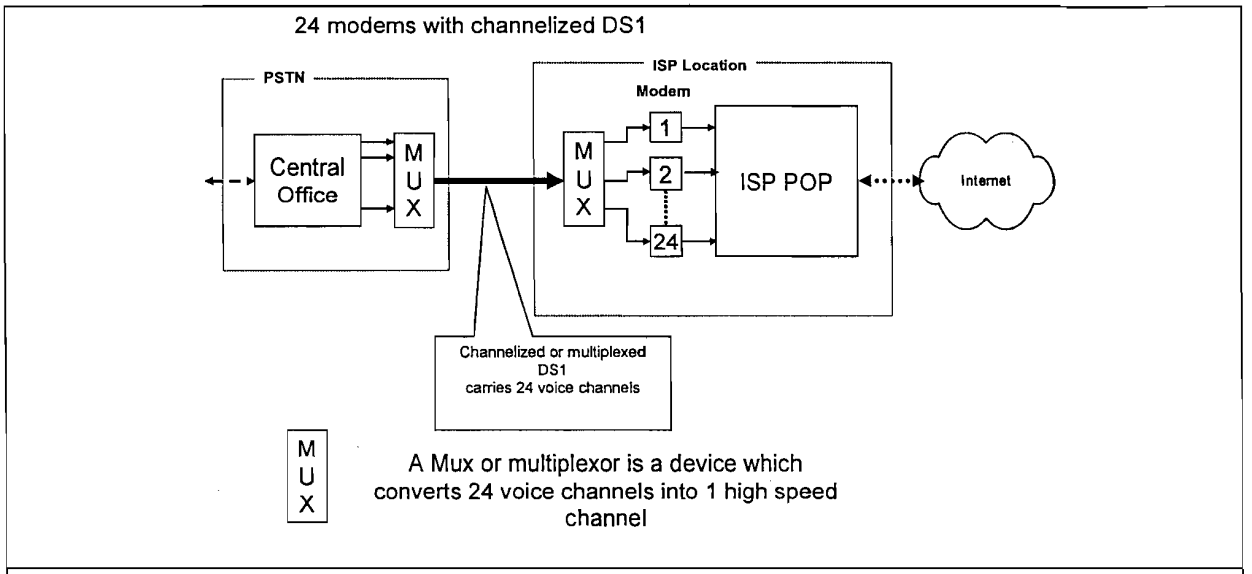


Figure 3

PRI (Primary rate interface)

11. In today's environment, most Central Offices use digital technology. In such a situation, the Central Office MUX on the Central Office end of the connection is not required as the Central Office already uses the digital representation of the voice signal (see Figure 4).

12. With digital technology Central Offices, local telephonic quality access between the Central Office and a modem pool will usually use what is called Primary Rate Interface (PRI). PRI uses a DS1 but provides only 23 voice channels. The signaling information that is contained in each of the 23 individual channels of a Channelized DS1 is concentrated into the 24th channel of a PRI.

13. It should be noted that PRIs are also used to provide telephonic quality access between the Local Exchange service and business switches (such as Private Branch Exchanges or PBXs and Call Centers).

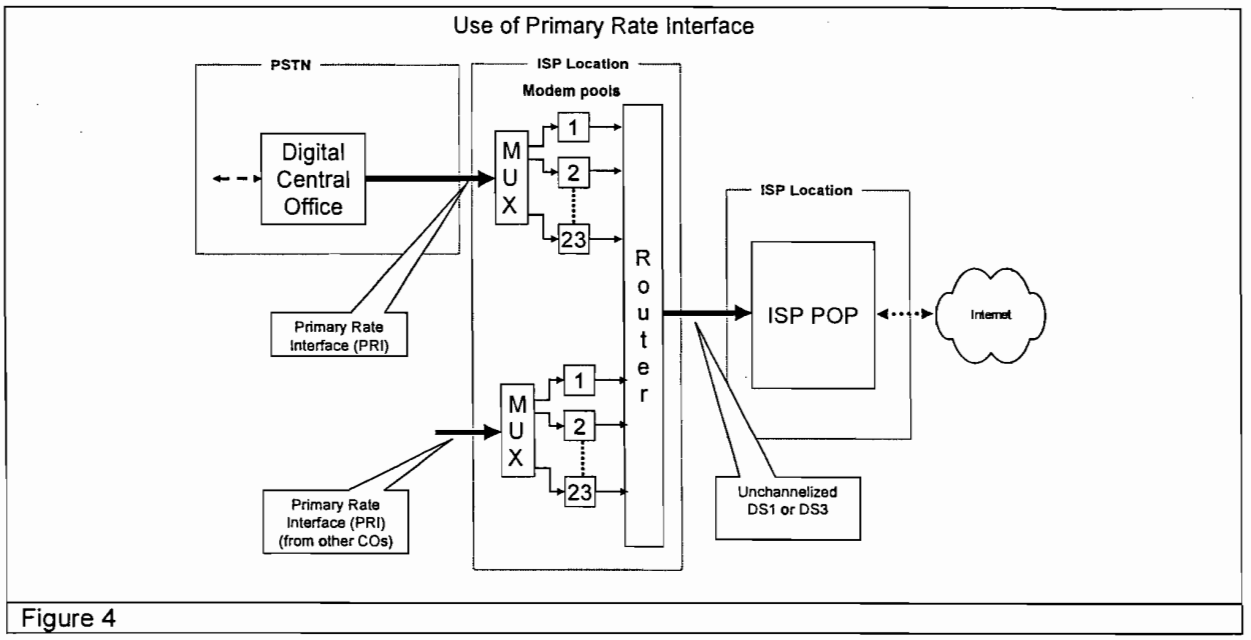


Figure 4

Application of Digital Signal Processors (DSP)

14. With PRI interfaces, the MUX/modems used at the ISP locations bear no resemblance to the dial-up customer's modems connected to their home computers. The PRI delivers a series of digital representations of the voice signals. Instead of converting these back to a voice signal for input to a traditional modem, the series of digital signals are input to a small special purpose computer (called a Digital Signal Processor or DSP) which contains a program to convert this series of digital representations to information to and from the internet.

15. In the PRI, there is one channel permanently assigned to each dial-up customer for the duration of the call. This means that capacity is wasted when the call is connected but there is no activity on the line. The unchannelized DS1 or DS3 uses what is known as packetized data. The Router collects information from the Modem or DSP into a packet of information. This packet is then transmitted to the ISP as needed. In the reverse direction, the Router receives a packet of information destined for a particular dial-up customer and dispenses it to that dial-up customer in telephonic quality voice format, either as modem tones or, with VoIP, as standard speech.

Colocation of ISP equipment in LEC Central Office

16. A further development used by UUNET, as well as other ISP vendors, is to colocate their equipment in the LEC Central Office. Colocation means UUNET and ISP locate their interface equipment in the same physical facility at the central office. Colocation has the major advantage that with typical dial-up internet customers, the traffic from 6 PRIs can be concentrated onto only one DS1. This reduces the capacity, and therefore cost, of the connections from the Central Offices to the ISPs POPs. This is shown in Figure 5. This is the basis of what UUNET calls COBRA (Central Office Based Remote Access) service.

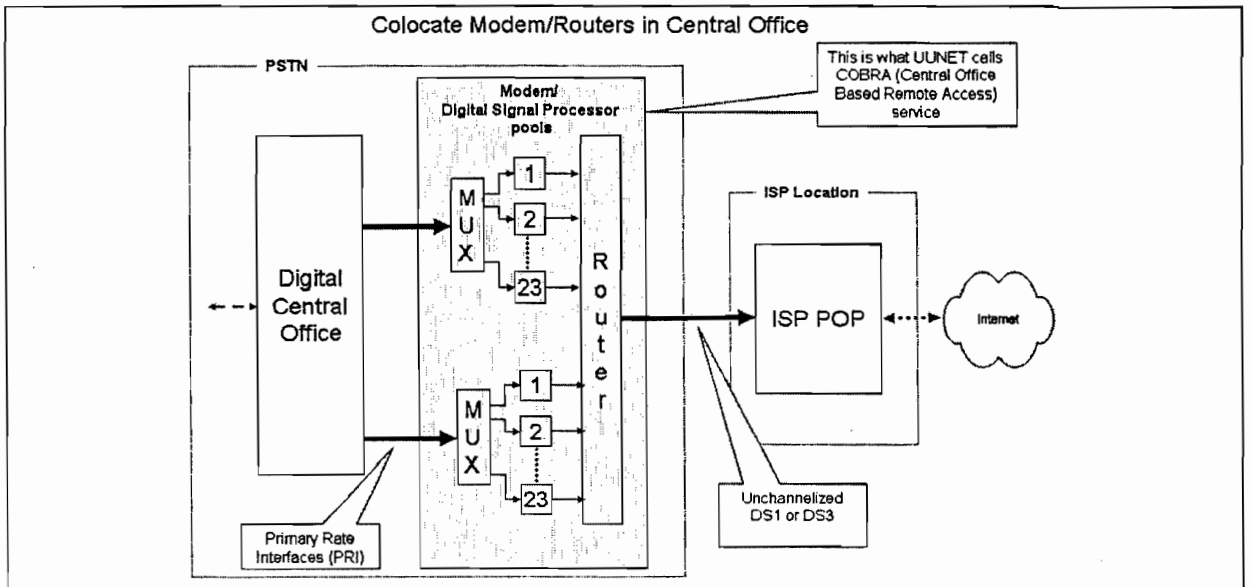


Figure 5

Use of these connections for Voice over IP (VoIP)

17. VoIP describes a range of technologies whereby the Internet may be used to make telephone calls between internet subscribers (and between internet subscribers and users' regular telephones). The use of DSPs makes it practical to change the function of a DSP on a call by call basis. So one call may be for internet access and the next one on that same port may be for Voice over IP (VoIP). As discussed in my Declaration, the LECs and ISPs recognize this capability and include contractual language covering its possible use.

9/22/05

Michael Hills, date

EXHIBIT F

Michael Hills Qualifications and Publications

President and founder of HTLT Telemanagement Ltd

1980 Founded HTLT Telemanagement Ltd. which specializes in traffic engineering, tariff based pricing and optimization of telecommunications networks.

1976 Consultant to Cable and Wireless plc (UK) in the USA

1966 to 1976 Lecturer/Senior Lecturer/Reader - Department of Electrical Engineering, University of Essex

1964 to 1966 Lecturer - Department of Electrical Engineering, Imperial College of London University

Received Bachelor of Science degree (First Class) in Physics (1962) and Ph.D. in Electrical Engineering (1969) from the Imperial College of London University.

Publications by Michael T. Hills, (in last ten years)

What If Access Charges Are Applied To IP-Originated Calls?
(May 2005 Business Communications Review)

Traffic Engineering for Voice over IP
(Sept 2002 Business Communications Review)

Voice Service: Confusion Growing, Prices Falling
(Feb 1999 Business Communications Review)

Waiting for the Tariff Revolution?
(Sep 1997, Business Communications Review)

Depositions and testimony on telecommunications matters (in last 10 years)

Expert witness for the federal government in XO Communications Inc .v. United States, Fed Cl.No 03-2754T

WEIL, GOTSHAL & MANGES LLP
Attorneys for Debtors and Debtors In Possession
767 Fifth Avenue
New York, NY 10153-0119
Telephone: (212) 310-8000
Facsimile: (212) 310-8007
Marcia L. Goldstein, Esq. (MG 2606)
Lori R. Fife, Esq. (LF 2839)
Alfredo R. Pérez, Esq. (admitted *Pro Hac Vice*)

UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF NEW YORK

In re	:	**Chapter 11 Case No. 02-13533(AJG)**
WORLDCOM, INC., et al.,	:	**(Jointly Administered)**
Debtors.	:	

DECLARATION OF JOHN R. ANDERSON IN SUPPORT OF THE REORGANIZED DEBTORS' OBJECTION TO THE REQUEST OF INTERNAL REVENUE SERVICE / DEPARTMENT OF TREASURY FOR PAYMENT OF ADMINISTRATIVE EXPENSE CLAIMS

JOHN R. ANDERSON hereby declares pursuant to section 1746 of title 28 of the United States Code:

1. I am the Director of Switch and Internet Protocol Planning and Implementation, for the above-captioned debtors and reorganized debtors (collectively, "MCI" or the "Debtors"). I am responsible for Switched IP Network Design, Capacity Planning, and Implementation of MCI's domestic Internet Dial-Up Access network, Voice over Internet Protocol ("VoIP") network, Local and Long Distance voice networks.

2. I have worked in the telecommunication industry for 26 years. During this period I have been responsible for numerous functions, which include Switch

Routing and Translations, CCS7 Signaling Networks, Packet Network Planning, Field Operations, Central Office Management and Network Construction. I have a Bachelor of Arts degree in Business Management, with a minor in Computer Science, from North Central College, Naperville, Illinois. Prior to receiving my Bachelor's degree, I also graduated from the Air Force Technical School as a Telecommunications Technician. Prior to my employment with MCI, I was employed by the United States Air Force as a Staff Sergeant in charge of Microwave Telecommunications systems.

3. In my professional opinion, the central office based remote access ("COBRA")[1] services purchased by the Debtors from local exchange carriers ("LECs") do not provide access to a local telephone system, nor does it provide the privilege of telephonic quality communication with substantially all persons having telephone or radio telephone stations constituting a part of such local telephone system, for several reasons, including the following: (a) the COBRA services only provide the Debtors with an Internet Protocol high-speed data stream from the LEC, and the Debtors cannot plug in a telephone, Private Branch Exchange, Key Set, or any other recognized instrument for making telephonic quality calls; (b) COBRA services cannot originate (dial-out) any type of call, and cannot receive telephonic quality voice calls from users of the Public Switched Telephone Network (the "PSTN"); (c) the Debtors do not have the ability to reconfigure the COBRA services purchased from the LECs into a system that would be capable of originating or terminating voice calls; (d) the COBRA services purchased by

[1] As used in this Declaration, the term "COBRA" refers solely to central office based remote access services purchased by MCI and is not intended to refer to any other telecommunications service that may be purchased or used by any other person, entity or governmental unit, whether or not such other telecommunications service may be commonly referred to as COBRA service by an entity other than MCI.

the Debtors contain dated technology that lacks the hardware, software and/or firmware required to process telephonic quality voice calls; and (e) the COBRA services purchased by the Debtors lack several components that would be required for any telephonic quality voice communication, such as gateways, SIP servers, session border controllers, and suitable routing engines.

4. Moreover, in my professional opinion, the COBRA service provided by the LECs to MCI entitles MCI to exclusive or priority use of any communication channel or groups of channels, regardless of whether such channel or groups of channels may be connected through switching to the PSTN.

5. I have reviewed and considered information contained in the following documents in reaching these conclusions:

a. Documents produced by the Debtors to the IRS and Bates-labeled DOJ 00001 – DOJ 00265. Selected portions of these documents have been attached hereto in Exhibit A.

b. The IRS' Reply to the Debtors' Objection to the Request of Internal Revenue Service / Department of Treasury for Payment of Administrative Expense Claims, including the Declaration of Dr. Michael Hills in support of that Reply, and all attachments to the Declaration of Dr. Michael Hills. These documents have been attached hereto in Exhibit B.

c. Detailed descriptions of equipment and equipment capabilities provided in the vendor manuals and correspondence attached hereto in Exhibit C.

The paragraphs that follow explain (a) the COBRA technology that the Debtors purchased from the LECs in order to facilitate Dial-Up Internet Access on a large scale, and (b) how COBRA differs from any plausible telephonic quality voice service.

PART I: COBRA SERVICE – AN ANTIQUATED DATA SERVICE THAT IS NOT CAPABLE OF TELEPHONIC QUALITY COMMUNICATIONS

6. **Introduction to Dial-Up Internet Services.** A modem, or Digital Signal Processor ("DSP"), is a device that converts digital information from the computer to an analog data signal and vice versa. By using the modem, digital data on home computers can be sent over phone lines, which almost all homes have available. To allow for a large population to connect via modems to the Internet, the telecommunications industry developed networks with large scale modem deployment that allowed a home PC to gain access to the Internet using a local telephone line. Thus was born the term "Dial-up Internet Access."

6.1. **What is COBRA?** During the 1990's, LECs began to offer a wholesale product called COBRA to any company with an internet backbone (such as MCI) in order to facilitate and enable dial-up internet access by retail customers of internet service providers ("ISPs") like AOL and MSN. With COBRA, the LECs aggregate dial-up data transmissions from multiple end-users of the internet, process those data transmissions by means of modem banks and routers into high speed data streams, and then transmit those data streams to companies like MCI. Dial-up ISPs, such as AOL or MSN, use MCI's internet backbone to access the data streams transmitted by the LECs through COBRA. This allows the ISPs' retail customers to access the internet.

6.2. **How does COBRA Work?** As reflected in Figure 6.1 below, the Dial-up User's modem dials a local telephone number associated with a LEC's modem bank, or Network Access Server ("NAS"). The LEC connects that data transmission to the NAS via a switch and a Primary Rate Interface ("PRI") trunk. The NAS converts analog data from multiple Dial-up Users into packet data streams that are compatible with the internet. This high speed data stream is then transmitted via a frame relay line card or router to MCI's internet backbone network. The dividing point between MCI's network and the LEC's COBRA equipment is a frame relay circuit which connects from the frame relay line card on the NAS to the MCI backbone equipment in an MCI facility.

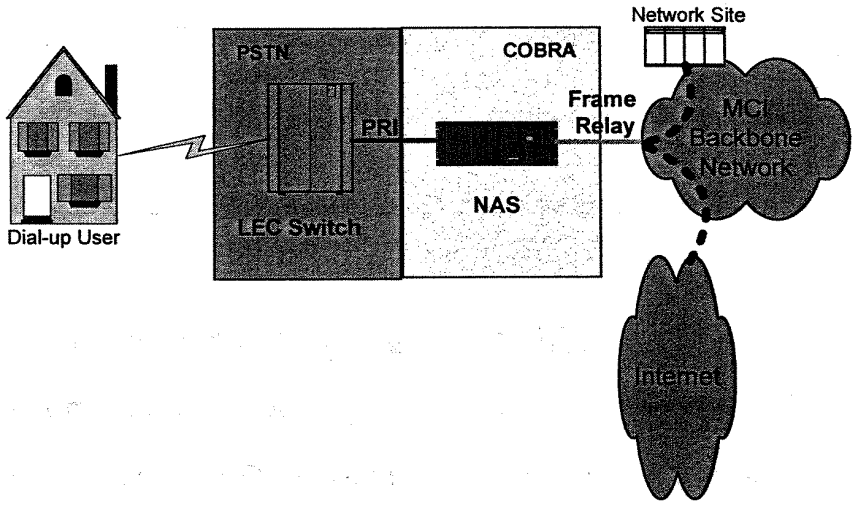


Figure 6.1

7. **The System Architecture and Structural Components of COBRA are not Capable of Telephonic Quality Communications.**

7.1. **The Dial-up User's Equipment.** A Dial-up User needs three components at his or her home in order to access the internet. The first component is the PC, which has a modem either built into the computer or has a

separate modem unit that plugs into the computer. The modem is then connected to the second component, a standard telephone line wall jack, exactly like the wall outlet used to plug in a regular telephone. The third component is an active local loop from a local telephone company which connects into the local exchange carrier's network. Figure 7.1 illustrates these components. The local loop is purchased by the Dial-up User from the LEC, and any usage charges and taxes from the local telephone company for use of that local loop are absorbed by the Dial-up User, not MCI.

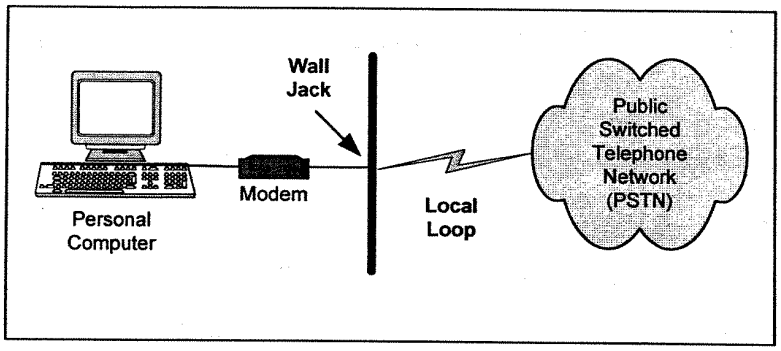


Figure 7.1

7.2. **The LECs' Equipment.** The data transmission originated by the Dial-up User will be connected through a series of central offices containing switches until it connects with the central office where the connection to the ISP resides. Figure 7.2 below illustrates this process. The facilities used to make this connection are commonly referred to as the Public Switched Telephone Network, or PSTN. Both the PSTN and COBRA are (a) provided by the LEC, and (b) owned and maintained by the LEC on LEC premises and/or facilities.

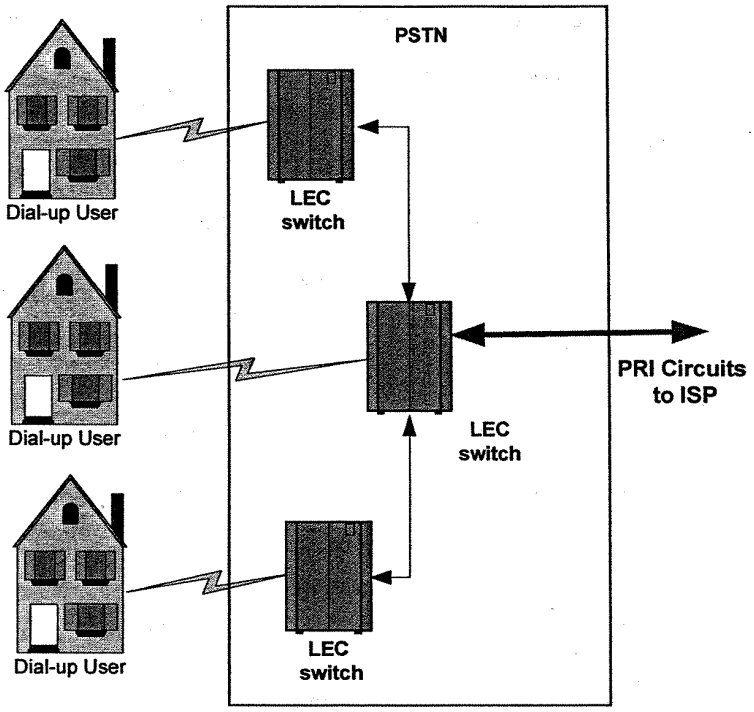


Figure 7.2

7.3. **Three Components in a COBRA Configuration.** COBRA services, as shown in Figure 7.3, include three key components: (i) a Primary Rate Interface; (ii) a Network Access Server; and (iii) a frame relay or router.

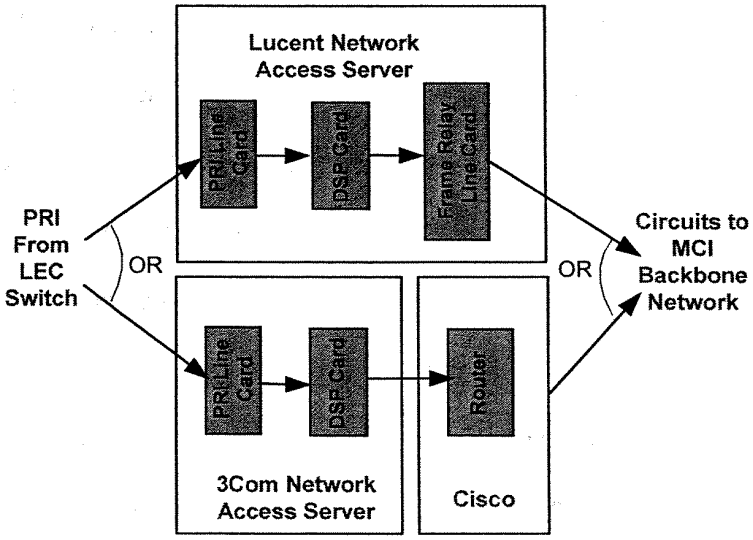


Figure 7.3

7.3.1. The PRI. The first component is the PRI. A COBRA configuration involves a large volume of circuits between the LEC's switches and the LEC's modem bank, or NAS. The PRI is a circuit that contains 24 local loops or channels. In the case of COBRA based PRIs, only 23 of the 24 channels actually carry data. The 24th channel is used to set up and track the data carried on the other 23 channels. Figure 6.1 above provides a simple illustration of the Primary Rate Interface between the LEC's switches and the LEC's NAS.

7.3.2. The Network Access Server. The PRI is then connected to the LEC's modems contained in the NAS. The NAS is a shelf that holds the circuit boards which perform the COBRA modem functions. The NAS hardware has PRI Line Cards installed with the specific role of accepting the PRI circuits and separating the 23 individual channels into 23 distinct units. In the case of the COBRA services purchased by the Debtors, the PRI carries a digital copy of the data originated from the Dial-up User's modem. The hardware used to provide the modem function on the NAS is the Digital Signal Processor, or DSP. Two vendors provided DSP hardware for the Debtors' COBRA services: Lucent and 3Com. While there are hardware, firmware and software differences, the basic functions of DSPs from both vendors are the same. The DSP has three basic functions. The first function is to accept the data signal when it arrives on a channel across the

PRI. The second function is to convert the analog data signal information to a data stream (also called data packets) to be sent to the ISP's network. One example of this second function occurs when the Dial-up User sends a request for Google's web site from his PC. The DSP takes that data request which was in analog data format, and converts it into data packets which are transmitted to the ISP network for delivery to Google's web site. The third function is to convert data packets from the ISP network to analog data format to be delivered back to the Dial-up User. This would be Google's web page downloading to the Dial-up User's computer for display on the user's computer screen. Both Lucent and 3Com NAS hardware hold all of the cards required to support this DSP function, as shown in Figure 7.3 above. The individual channels on the PRI Line Cards (also on the NAS), are forwarded to the DSP cards as part of data acceptance.

7.3.3. Frame Relay and Routers. As shown in Figure 7.3 above, the third key component of COBRA services is the frame relay or router function which is the point of interface in the network from the Digital Signal Processors (modems) toward the ISP network.

7.4. **The NAS Cards used in COBRA are Dated and are not Capable of Telephonic Quality Communications.**

7.4.1. The Lucent NAS Cards Supplied with COBRA do not Support Voice Communication. The Lucent NAS configuration stipulates

part numbers for the two types of DSP cards which would be supported in the Verizon and Qwest COBRA service, respectively. See, Exhibit A, DOJ-00245 and DOJ-00246. BellSouth and SBC follow the same design criteria. According to the manufacturer, card part numbers TNT-SL-48MODV3-S-C and TNT-SL-HLDC2 do not have the ability to support voice communications over an internet protocol. See Exhibit C-1, Letter from Donald Woods, Lucent Technical Sales, to John Anderson (October 18, 2005); Exhibit A, DOJ-00247 through DOJ-00250.

7.4.2. Lucent NAS Cards Operate at the Wrong Frequency for Voice Communications. To further prove this point, in the Lucent platform, the DSP cards deployed by the LECs to provide COBRA services to the Debtors are only capable of recognizing a 1300 hz signal so that it can negotiate data using V.25 protocol, in accordance with the governing standards established by the International Telecommunications Union (the "ITU"). These instructions are hard-coded into the hardware so that the DSP will only recognize this tone. If it gets any other tone, voice or sound from the end user, it will not be able to accept the connection and will disconnect the end user. On the other hand, were voice calls a desired feature, all instructions for answering or originating voice calls would have been required to be present on the DSP cards. The Lucent DSP cards deployed in the COBRA services purchased by the Debtors were not equipped to

permit voice calls. See Exhibit C-1, Letter from Donald Woods, Lucent Technical Sales, to John Anderson (October 18, 2005).

7.4.3. The 3Com NAS Cards Supplied with COBRA do not Support Voice Communications. Similarly, the 3Com NAS configuration deployed in COBRA is not capable of supporting voice telephony and could not do so without a hardware change. See Exhibit C-3, Commworks' (formerly, 3Com) IP Telephony Overview Guide, Release 2.3, at 17 and 18. Specifically, these documents show the need for EdgeServer Pro cards in the modem chassis to handle voice calls and COBRA did not contain the required EdgeServer Pro cards. See, Exhibit A, DOJ-00234.

7.4.4. As Configured and Supplied by the LECs, COBRA is Not Capable of Voice Telephony. The COBRA configuration supplied by the LECs uses dated system hardware. In my opinion, no telephonic quality voice communications can be originated or received via the COBRA equipment provided to MCI.

7.5. **The Frame Relay and Routers used in COBRA are not Capable of Telephonic Quality Communications.** As shown in Figure 7.3 above, the Debtors' COBRA services used either a frame relay configuration provided by Lucent, or a router configuration provided by 3 COM a/k/a UT Starcomm. In my opinion, both configurations fail to provide a system that would be capable of telephonic quality voice communications. Each configuration is explained below.

7.5.1. Lucent Hardware Uses Frame Relay. For Lucent hardware, as shown in Figure 7.3, the DSP converts the data calls into a frame relay data stream. This data stream is sent to the frame relay line card. The frame relay line card has multiple dedicated frame relay T1 data circuits which connect to the MCI Frame Relay switch on the backbone network. This card acts as a router to spread the data streams across the available data circuit capacity, and buffer any temporary spikes in data traffic.

7.5.2. The Lucent Frame Relay Supplied with COBRA does not Support Voice Communications. In my opinion, Lucent's frame relay connections used with COBRA services are not capable of originating and terminating telephonic quality communications. Voice services can only be supported on a Lucent platform over Ethernet connections. See, Exhibit A, DOJ-00252. Telephonic quality communications on a Lucent platform are not possible with frame relay connections. The Lucent hardware used with COBRA is frame relay. See, Exhibit A, DOJ-00168, DOJ-00178, DOJ-00246.

7.5.3. The 3Com Hardware Uses Routers. For the 3Com / UT Starcomm platform (called a Commworks TCH 1000), a data stream is sent to the router. The router is then connected to the MCI backbone network. The router spreads the data streams across the available data circuit capacity, and buffers any temporary spikes in data traffic.

7.5.4. The 3Com Routers Supplied with COBRA do not Support Voice Communications. In my opinion, the Commworks TCH 1000 router connections used with COBRA services do not support the origination and termination of telephonic quality communications. If voice communications were a desired feature, the UT Starcomm platform requires an EdgeServer Pro line card and an Edge server line card. See Exhibit C-3, Commworks' (formerly, 3Com) IP Telephony Overview Guide, Release 2.3, at 17 and 18. Each chassis must have this configuration to support telephonic quality communications. The COBRA hardware configuration used by the Debtors lacked the EdgeServer Pro line card or the Edge server line card. See, Exhibit A, DOJ-00188, DOJ-00233, DOJ-00234, DOJ-00235. As a result, the existing COBRA configurations are not capable of telephonic quality communications.

8. **COBRA Service Provides MCI with Exclusive Use of any Communication Channels.** As shown in Figures 7.2 and 7.3 above, COBRA service uses a PRI with 24 channels to connect the NAS to the LECs' switches. In addition, the NAS contains up to 672 channels. MCI has exclusive or priority use of such channels within the COBRA service, regardless of whether such channels may be connected through the LECs' switches to the PSTN. MCI is separately charged by the LECs for COBRA service.

Part II: COBRA SERVICES ARE READILY DISTINGUISHABLE FROM SYSTEMS THAT PROVIDE TELEPHONIC QUALITY VOICE COMMUNICATIONS

9. **Local Telephone Services.** With local telephone service, a customer has the ability to use a telephone to dial a telephone number which is transported via their access line to the local telephone company office. The local telephone company sends that call to the local telephone company office that serves the dialed customer. The serving local telephone company office then completes the telephone call via the terminating customer's purchased local access phone line.

10. **What is VoIP?** Voice over Internet Protocol ("VoIP") is a technology that is used to transmit voice conversations over the Internet or other private networks which support Internet Protocol ("IP"). VoIP works by sending voice information in digital form, also called IP packets, rather than in the traditional circuit-switched method of the public switched telephone network. VoIP technology requires a combination of specific hardware and software.

10.1. **How does VoIP Differ from COBRA?** In my opinion, COBRA is readily distinguishable from VoIP technology. In order to engage in VoIP calls, a Voice Gateway with VoIP capability, and access to the appropriate VoIP call routing server (an SIP server) and SIP End Point are required. COBRA has none of these components. Figure 10.1 shows the requirements and the differences between a data call and a VoIP call. Figure 10.2 shows a simple VoIP network and the required system components.

	Data Call	VoIP Call
User Requirement	User needs to connect to the Internet to browse the Web, check email, download files	User needs to connect to the Internet to establish a voice conversation with another user
Hardware Requirement	**Scenario 1:**	**Scenario 1:**
	Calling Party: PC and Modem	Calling Party: Any telephone
	Called Party: NAS	Called Party: SIP enabled device, phone
	Scenario 2:	**Scenario 2:**
	With COBRA configuration, call from the Internet to a PSTN phone is not possible.	Calling Party: SIP enabled device, phone
		Called Party: Any telephone
Network Infrastructure Requirement	Network Access Server with DSP programmed and capable to receive data calls from **modems**. Authentication (RADIUS), Billing and Accounting servers.	VoIP Gateway with DSP programmed and capable to receive calls from a **phone**, SIP, Billing and Accounting servers.

Figure 10.1

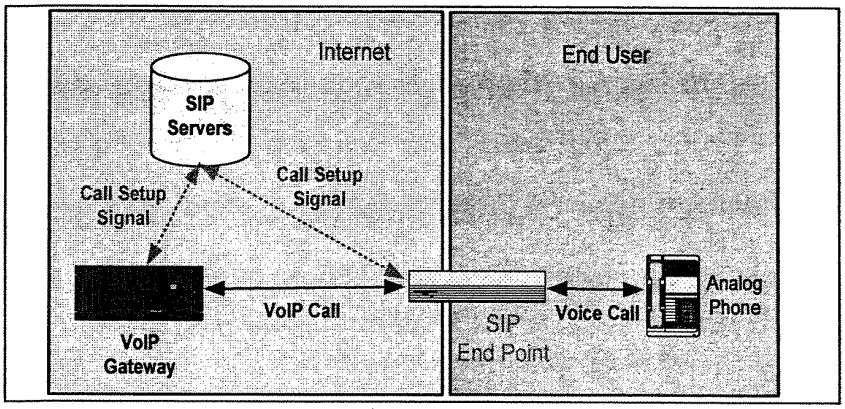


Figure 10.2

10.2. **Equipment Differences Between VoIP and COBRA Networks.**

The equipment used in the existing COBRA configuration is incompatible with a VoIP network. For the Lucent MAX TNT platform to act as a Voice Gateway as shown in Figure 10.2, the following hardware modules are required and are the only hardware modules capable of supporting VoIP according to the manufacturer:

Model	Description
TNT-SL-ADI-C	48-Port MultiDSP card
APX8-SL-96DSP	96-Port MultiDSP Card

See, Exhibit A, DOJ–00247 through DOJ–00250; Exhibit C-1, Letter from Donald Woods, Lucent Technical Sales, to John Anderson (October 18, 2005).

10.2.1. The Lucent NAS used in COBRA Cannot Support VoIP. The COBRA configuration sold by the LECs to MCI did not contain the appropriate hardware and software for VoIP capability. With respect to hardware, the MAX TNT configurations used with COBRA services did not utilize the cards specified in paragraph 10.2. See, Exhibit A, DOJ-00245 and DOJ-00246. License keys (Hash Codes) are also required to enable VoIP functionality on the MAX TNT. These keys are purchased from Lucent and are based on the Serial number of the chassis Control Module. MCI has not purchased license keys for VoIP functionality.

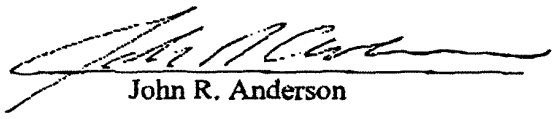
10.2.2. The 3Com NAS used in COBRA Cannot Support VoIP. 3Com's Commworks TCH 1000 platform cannot act as a VoIP Media Gateway without an EdgeServer Pro line card and an Edge server line card. See Exhibit C-3, Commworks' (formerly, 3Com) IP Telephony Overview Guide, Release 2.3, at 17 and 18. Each chassis would need this configuration to support VoIP. The existing COBRA hardware "Modem Chassis" was configured by the LECs without the EdgeServer Pro or the Edge server line card. See, Exhibit A, DOJ-00188, DOJ – 00234, DOJ-00235. Such configurations would not be VoIP capable.

CONCLUSION

11. COBRA is a data service, not a voice or telephone service, that is capable only of providing the Debtors with an Internet Protocol high-speed data stream from the LEC. Accordingly, COBRA service used by the Debtors does not provide access to a local telephone system, nor does it provide the privilege of telephonic quality communication with substantially all persons having telephone or radio telephone stations constituting a part of such local telephone system. COBRA service also provides MCI with exclusive or priority use of any channel or group of channels contained in the PRI or NAS, regardless of whether such channels may be connected through the LECs' switches to the Public Switched Telephone Network.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information and belief.

Dated: Richardson, Texas
November 1, 2005



John R. Anderson

EXHIBIT A